Environmental Studies

LOOKING AROUND

Textbook for Class V

0529

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Foreword

The National Curriculum Framework (NCF) 2005, recommends that children's life at school must be linked to their life outside the school. This principle marks a departure from the legacy of bookish learning which continues to shape our system and causes a gap between the school, home and community. The syllabi and textbooks developed on the basis of NCF signify an attempt to implement this basic idea. They also attempt to discourage rote learning and the maintenance of sharp boundaries between different subject areas. We hope these measures will take us significantly further in the direction of a child-centred system of education outlined in the National Policy on Education (1986).

The success of this effort depends on what steps that school principals and teachers will take to encourage children to reflect on their own learning and to pursue imaginative activities and questions. We must recognise that, given space, time and freedom, children generate new knowledge by engaging with the information passed on to them by adults. Treating the prescribed textbook as the sole basis of examination is one of the key reasons why other resources and sites of learning are ignored. Inculcating creativity and initiative is possible if we perceive and treat children as participants in learning, not as receivers of a fixed body of knowledge.

These aims imply considerable change in school routines and mode of functioning. Flexibility in the daily time-table is as necessary as rigour in implementing the annual calendar so that the required number of teaching days are actually devoted to teaching. The methods used for teaching and evaluation will also determine how effective this textbook proves for making children's life at school a happy experience, rather than a source of stress or boredom. Syllabus designers have tried to address the problem of curricular burden by restructuring and reorienting knowledge at different stages with greater consideration for child psychology and the time available for teaching. The textbook attempts to enhance this endeavour by giving higher priority and space to opportunities for contemplation and wondering, discussion in small groups, and activities requiring hands-on experience.

The National Council of Educational Research and Training (NCERT) appreciates the hard work done by the textbook development committee responsible for this book. We wish to thank the Chairperson of the Advisory Committee for Textbooks at the the primary level, Anita Rampal, *Professor*, CIE, Delhi University, Delhi, Chief Advisor, Farah Farooqi, *Reader*, Jamia Millia Islamia, New Delhi, for guiding the work of this committee. Several teachers contributed to the development of this textbook. We are grateful to their principals for making this possible. We are indebted to the institutions and organisations which have generously permitted us to draw upon their resources, material and personnel. We are especially grateful to the members of the National Monitoring Committee, appointed by the Department of Secondary and Higher Education, Ministry of Human Resource Development under the Chairpersonship of Professor Mrinal Miri and Professor G.P. Deshpande, for their valuable time and contribution.

As an organisation committed to systemic reform and continuous improvement in the quality of its products, NCERT welcomes comments and suggestions which will enable us to undertake further revision and refinement.

Director
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New Delhi
30 November 2007

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A Note for the Teachers and Parents

The National Curriculum Framework (2005) views Environmental Studies (EVS) in Classes III to V as a subject which integrates the concepts and issues of science, social science and environment education. This subject is not there in Classes I and II, but the issues and concerns related to it are meant to be a part of Language and Mathematics.

This textbook is child centred, so that children get a lot of space to explore and are not compelled to learn by rote. There is no place for definitions and mere information in this book. The real challenge is to provide children with opportunities to express, learn by doing, ask questions and experiment. The language used in the book is not formal but that spoken by children. Children see a page of a book as a holistic 'visual text' and not separately as words and illustrations. Pages have been developed keeping this in mind. The textbook is not the only source of knowledge, but should support children to construct knowledge through all sources around them, such as people, their environment, newspapers, etc.

The chapters in this book contain real life incidents, everyday challenges and live contemporary issues – related to petrol, fuel, water, forests, protection of animals, pollution, etc. There are ample opportunities for children to freely debate, engage with and develop a sensitive understanding about these. The writing team views not just children but teachers too as people who construct knowledge and expand their experiences. Thus teachers also need to use this book as a teaching-learning resource.

The new syllabus consists of six themes – (1) Family and Friends, which consists of four subthemes – (1.1) Relationships, (1.2) Work and Play, (1.3) Animals and (1.4) Plants. Others are – (2) Food; (3) Water; (4) Shelter; (5) Travel and (6) Things We Make and Do.

What do we understand by a syllabus? The list of chapters in the textbook is often mistaken to be a syllabus. If we look at the NCERT syllabus, we find that an attempt has been made to develop a deep and inter-related understanding of each theme . Each theme begins with key questions in a language suitable for children. The whole syllabus is available on the NCERT website www.ncert.nic.in. Also try to get the printed version. On reading it you will enjoy teaching the subject with a deeper understanding.

Theme 2 – Food

The theme on 'Food' integrates all these – tasting, digesting, cooking, preserving techniques, farmers and hunger. **Chapter 3** does not contain information about the digestive system, but children's experiences have been used to build an understanding that the process of digestion begins in the mouth itself. This chapter also includes an amazing real story through which the world first came to know about the role of the stomach in digestion. Later in the chapter, through a description of the food habits of two children – one who doesn't get enough food to eat, and the other who takes only chips and cold drinks, the chapter tries to raise questions about what is 'good food'. Also, why do people who grow crops not get enough to eat?

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In **chapter 4**, through the story of *mamidi tandra*, children understand the technique and skills involved in preservation and cooking. The story of a *bajra* seed (**chapter 19**) addresses some questions of the syllabus again, like how changes in farming are linked to the changes and difficulties in the lives of farmers. Later you will see how the theme (2) on Food is linked with the subtheme on Plants (1.4).

Questions	Key Concepts/ Issues	Suggested Resources	Suggested Activities
When food gets spoilt			
How do we know that food is spoilt? Which foods spoil, sooner than others? What can we do to prevent food from getting spoilt? What do we do to keep it fresh during travel? Why do we need to preserve food? Do you waste food?	Spoilage and wastage of food, Preservation of food, drying and pickling.	Sharing family experiences; interaction with a person involved with food production/ preservation.	Keep some Bread or, – other food for a few days – see how they spoil.
Who produces the food we eat?			
Do you know of different kinds of farmers? Do all farmers own land?How do farmers get the seeds they need to plant every year? What else besides seeds is required for a crop to grow?	On different types of farmers. Hardships faced in subsistence farming, including seasonal migration. Need for irrigation, fertilisers.	Farmers' narratives – could take an example from Punjab and Andhra Pradesh. Story of a child missing school because of seasonal migration. Visit to a farm.	Experiment to know the conditions suitable for germination; observations on a farm.
Our mouth–tastes and even digests food!			
How do we taste food? What happens in the mouth to the food we eat? Why do we give glucose to patients? What is glucose?	Tasting food; *chapati*/ rice becomes sweeter on chewing; digestion begins in the mouth; glucose is a sugar.	Children's earlier experiences; samples of food items; story of someone on a glucose drip.	Tasting activity – action of saliva on rice/ *chapati*.

Theme – Family and Friends

Subtheme(1.1) – Relationships

Chapters 18 and **22** contain experiences of families who migrate in search of work. Children need help in understanding the difference between 'transfer' and 'displacement' so that they become sensitive towards problems faced by the urban and rural poor. **Chapter 21** focusses attention on how our identity is shaped by traits we inherit from our family and also the opportunities we get from our environment. The purpose of giving Mendel's story (the son of a poor farmer scared of examinations!) is not to focus on the principles of genetics but to be inspired by the process of scientific experimentation and his perseverance.

Subtheme (1.2) – Work and Play

In **chapter 15**, an interesting story by Dr. Zakir Hussain is used to develop an understanding of the process of breathing. Instead of dealing with the abstract concepts

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of 'water cycle' and 'condensation' in a traditional manner, everyday experiences of children have been used to suggest how a mirror becomes hazy when we blow on it. **Chapter 16** stresses on the dignity of labour and that no work is clean or dirty. Also, why do certain communities continue to do scavenging through generations and do not get opportunities to make their own choice? **Chapter 17**, 'Across the Wall,' consists of a real story of a girls' basketball team, presented in their own words, on the issue of gender.

Subtheme (1.3) – Animals

Chapter 1 sensitises children to the amazing world of animals – how they hear and see, smell and sleep. They also have the right to live and are pained on not getting food. **Chapter 2**, by raising issues related to the life of snakecharmers, look at the close relationship between animals and humans beings.

Subtheme (1.4) – Plants

Chapter 5 has experiments on germination the idea of seed dispersal and shows how some plants have come from far off countries but today we cannot imagine our food without them. **Chapter 20** depicts the life of tribals, through the real story of Suryamani in Jharkhand and Jhoom farming of Mizoram. It also addresses some popular perceptions and biases about tribal communities.

Theme 3 – Water

Chapter 6 gives a glimpse of traditional sources and the techniques of water arrangements in Rajasthan. It uses a recent example of a village doing water management by taking inspiration from history. **Chapter 7** has experiments with water which are related to our everyday life. Real dialogues of children are used in **chapter 8** to bring out the relationship between stagnant water, mosquitoes, malaria, blood testing, etc.

Theme 4 – Shelter

Using Gaurav Jani's amazing journey to the Himalayas, **Chapter 13** shows variations in the types of shelters in one state, and also how food habits, living conditions, language and clothes differ. In **chapter 14** through narratives of calamities like a flood or earthquake, an understanding is developed about why people live in neighbourhoods and which agencies are responsible in such times.

Theme 5 – Travel

Some important questions of the syllabus related to this theme are:

- Where have you seen petrol and diesel being used?
- Why do you think some people like to climb high mountains or cover difficult terrains?
- Have you ever read or heard about someone's experiences of space travel?
- Have you ever visited a historical monument? What do you think about the design of the building and other arrangements in it?

In **Chapter 9**, a teacher's mountaineering adventure raises the question as to why people take risks. It also gives a feel of high, snow covered and difficult mountain terrains, without giving direct information about facts of geography! **Chapter 10** uses a historical monument to introduce children to the techniques, designs, uses of metals, water arrangements, etc. of earlier times. An attempt is made to understand how 'war and peace', then and now, are a part of social and political life. **Chapter 11** engages with the challenging concepts of the

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'shape of the earth' and 'gravitation' using children's intuitive ideas. **Chapter 12** presents debates around the burning issue of why petrol and diesel are limited. The theme 'Travel' is not limited to 'transport' but is presented in a wider and more interesting perspective.

Theme 6: Things We Make and Do

This theme is integrated with all the other themes and emphasises processes and techinques. Wherever there are experiments in a chapter or things to make and do, children need to be given opportunities and space to engage with them.

What will Children Learn in EVS?

In this book there is a separate section 'What we have learnt' at the end of each chapter. These questions suggest how children's learning can be assessed after doing a chapter and also in the examinations. Answers should not be assessed in terms of only 'right/ wrong'. Childrens' ideas, observation reports, expression of their experiences, process of experiments, etc. are all opportunities for qualitatively assessing children's learning. This list of indicators for assessment in EVS can be used to record how children are learning.

Indicators for Assessment in EVS

1. Observation and Recording – Reporting, narrating and drawing; picture-reading, making pictures, tables and maps.
2. Discussion – Listening, talking, expressing opinions, finding out from other people.
3. Expression – Drawing, body movements, creative writing, sculpting, etc.
4. Explanation – Reasoning, making logical connections.
5. Classification – Categorising, grouping, contrasting and comparing.
6. Questioning – Expressing curiosity, critical thinking, developing good questions.
7. Analysis – Predicting, making hypotheses and inferences
8. Experimentation – Improvisation, making things and doing experiments.
9. Concern for Justice and Equality – Sensitivity towards the disadvantaged and differently abled.
10. Cooperation – Taking responsibility and initiative, sharing and working together.

Based on these indicators, teachers can observe 3-5 children everday and record their comments in order to better understand children's abilities and to encourage them accordingly. For better understanding on assessment practices and procedures in EVS, NCERT has developed a sourcebook on this area for primary stage. It will be useful if you go through this document as well.

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The following are applicable to all the maps of India used in this book:

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1. The responsibility for the correctness of internal details rests with the publisher.
2. The territorial waters of India extend into the sea to a distance of twelve nautical miles measured from the appropriate base line.
3. The administrative headquarters of Chandigarh, Haryana and Punjab are at Chandigarh.
4. The interstate boundaries amongst Arunachal Pradesh, Assam and Meghalaya shown on this map are as interpreted from the "North-Eastern Areas (Reorganisation) Act.1971," but have yet to be verified.
5. The external boundaries and coastlines of India agree with the Record/Master Copy certified by Survey of India.
6. The state boundaries between Uttarakhand & Uttar Pradesh, Bihar & Jharkhand and Chhattisgarh & Madhya Pradesh have not been verified by the Governments concerned.
7. The spellings of names in this map, have been taken from various sources.

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Lesson – 20 'Whose Forests?' – 'Girl Stars' a project of 'Going to school,' supported by UNICEF, (true story documented by the organisation). *The Last Frontier – People and Forests in Mizoram*, a book written by Daman Singh and published by TERI (reference material).

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1. Super Senses

Has this ever happened to you?

You were eating in the playground, an eagle flew down and took away your *roti*.

As you walked softly past a sleeping dog, its ears shot up at once.

You dropped something sweet on the ground and within minutes many ants collected around it.

Why does it happen? Think and tell

Animals also have different senses. They can see, hear, taste, smell and feel. Some animals can see their prey from far away. Some can hear even the faintest sound. Some animals can find their friends by their smell. The animal world is full of examples of amazing senses!

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How did the ant recognise a friend?

An ant was going along on the ground. It saw a group of ants coming from the other side. The first ant quickly came back to its hole. The ant guarding the hole recognised it and let it in.

Think and Tell

- How did the ant know that the other ants were not from its group?
- How did the guard ant recognise this ant?

Try this and write

Drop some sugar, jaggery or anything sweet on the ground. Wait until the ants come there.

- How long did it take for the ants to come?

  _____

- Did one ant come first or a group of ants came together?

  _____

- What did the ants do with the food?

  _____

- Where do they go from there?

  _____

- Do they move in a line?

  _____

Teacher's Note : Children of this age are interested in animals. Encourage them to share their experiences. Children should be supported to carry out observation activities which require patience.

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Now carefully, without harming the ants, block their path for a while with a pencil.

- Now observe, how do the ants move?

Many years ago a scientist did many experiments like this. He found out that as the ants move, they leave a smell on the ground. The other ants follow the smell to find the way.

- Now can you guess why the ants behaved like that when you blocked their path?

Some male insects can recognise their females by their smell.

- Have you ever been troubled by mosquitoes? Just think, how do they know where you are?

Mosquitoes can find you by the smell of your body. They also find you by the smell of the sole of your feet and the heat of your body.

I am a silk worm. I can find my female worm from many kilometres away by her smell.

- Have you seen a dog sniffing here and there? What do you think it is trying to smell?

Dogs mark out their own area on the road. They can make out if another dog has come into their area by the smell of its urine or potty (latrine).

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Write

- In what ways do human beings make use of this special sense of smell of dogs?

_____

- When do you find your sense of smell helpful to you? List some examples. Like – to know by its smell that food has gone bad or that something is burning.
- Name the animals that you would be able to recognise only by their smell, without seeing them?

_____

_____

- Write the names of five things whose smell you like and five things whose smell you do not like.

I like the smell of	I do not like the smell of
_____	_____
_____	_____
_____	_____
_____	_____
_____	_____

- Do you and your friends have similar answers?

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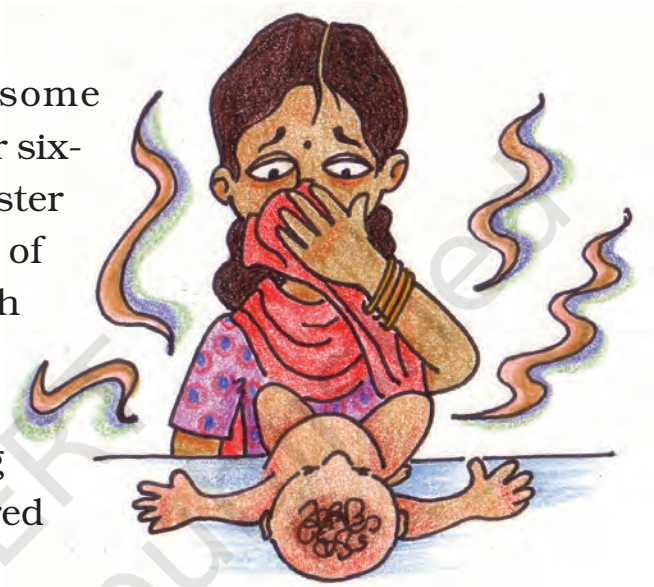
Discuss

- Do the clothes of any of your family members smell? whose?
- Did you ever come across any smell in a crowded place such as a fair, bus, train etc.

Why so?



Today Rajni had to go out for some important work. She had to leave her six-month old son Deepak with her sister Sushila. Sushila also has a baby of the same age. It was funny that both the babies did potty at the same time. She happily cleaned her daughter but when she was cleaning her sister's son Deepak, she covered her nose with her *dupatta* (scarf).

Think and discuss

- Sushila covered her nose when she cleaned Deepak's nappy, but not when she cleaned her daughter. Why do you think she did this?

- How do you feel when you walk near a heap of garbage? Think of the children who spend the whole day picking things from such garbage.
- Is a smell 'good' or 'bad' for everyone in the same way? Or does it depend on how each one feels about it?

Teacher's Note : Sushila's example illustrates a common situation in families. Discuss with children how we often find a smell 'bad' when we think it is from something dirty. If we analyse it, we may not be so offended by certain smells.

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Let's see

- Write the name of a bird which has eyes in front of its head (like in humans).
- Write the names of some birds which have eyes on either side of the head. What is the size of their eyes as compared to the size of their head?

Most of the birds have their eyes on either side of the head. Their eyes can focus on two different things at a time. When they look straight ahead, both their eyes focus on the same object.

You must have seen birds moving their neck very often. Do you know why? In most of the birds, eyes are fixed and cannot move. So birds have to turn their heads to see around.

Looking with one or both eyes

Close your right eye or cover it with your hand. Tell your friend to stand to your right, at some distance, and ask him to do some action (wave hand, shake head, etc.)

- Could you see your friend's action, without moving your neck?
- Now try to look at your friend's action with both your eyes open but without moving your neck.
- What was the difference on looking with one or both eyes?

Teacher's Note : When a bird focuses both eyes on an object, it can estimate the distance. When its eyes focus on two different things, it increases its range of vision. Children will understand this better, once they start observing the location of eyes of different birds. While seeing with one eye and then with two eyes, children will understand how with two eyes, the span of vision increases.

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- Now toss a small ball or a coin and try to catch it. Try this with both your eyes open. Then close one eye and try to catch it. When was it easier to catch?
- Imagine how it would be to have your eyes in place of your ears? What would you be able to do then, which you cannot do now?

Some birds like kites, eagles, vultures can see four times as far as we can. These birds can see things from a distance of eight metres what we can see from a distance of two metres.

- Now can you guess from what distance can an eagle in the sky can see a *roti* on the ground?

Do animals see colours?

Animals cannot see as many colours as we can. See how things in these pictures will be seen by some animals.

Deepa Balsawar

It is believed that animals that are awake in the daytime can see some colours. Those animals that are awake at night can see things only in black and white colours.

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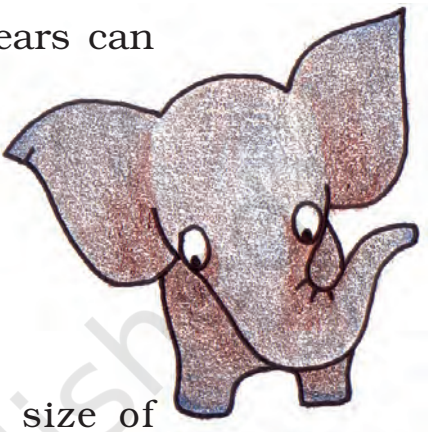
Sharp ear

In Class IV, you read that we cannot easily see birds' ears. Their ears are small holes covered with feathers.

Write

- The names of ten animals whose ears can be seen.
- The names of some animals whose ears are bigger than our ears.



Think

- Is there some link between the size of animals' ears and their hearing?

Try this

For this activity find a quiet place in your school. Tell one of your friends to stand at a short distance and ask him to say something softly. The rest of you should listen carefully. Then all of you put your hands behind your ears, as shown in the picture. Let the same child say something again as softly as before. In which case was the sound sharper? Ask your friends too.

- Put your hands over your ears and say something. Can you hear your own voice?

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- Sit near a desk. Tap the desk once with your hand. Listen carefully. Now put your ear on the desk as shown in the picture. Tap on the desk once again with your hand. Listen again. Was there any difference in the sound of the tap?

This is how snakes hear. They do not have external ears (which you can see). They only feel the vibrations on the ground.

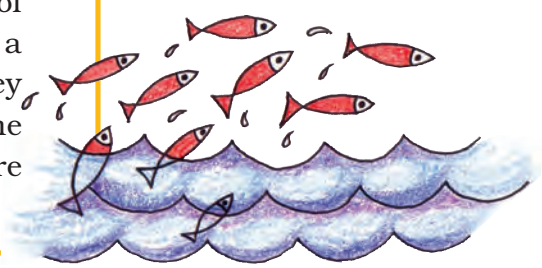
Deepa Balsawar

Sounds send messages

- High up on a tree, a *langur* warns others of dangers like a tiger or leopard. The *langur* does this by making a special warning call.
- Birds also give alarm calls to warn about the danger. Some birds even have different sounds for different kinds of dangers. For example, there is a different warning call if the enemy is coming from the sky or if the enemy is on the ground.
- Fishes give alarm call by electric signals.

Some animals start behaving in a different way when an earthquake or storm is about to come. People who live in forests and can observe such behaviour of animals come to know of the danger.

In December 2004, few tribes that live in the forests of the Andaman Islands noticed the animals behaving in a different manner. They guessed some danger. So they moved away to a safer part of the island. Soon after, the islands were hit by the tsunami but these people were saved.



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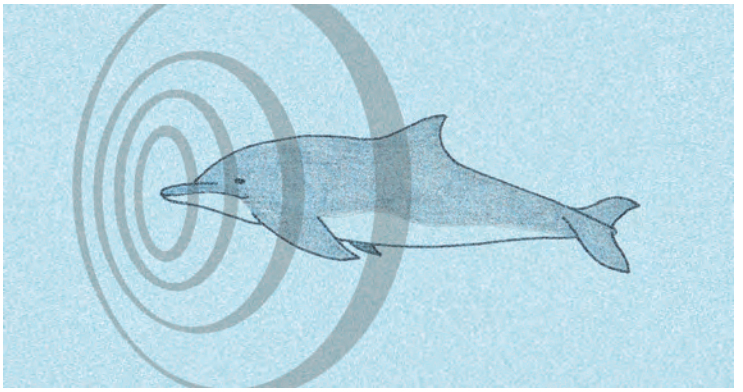
Dolphins also make different sounds to give messages to each other. Scientists believe that many animals have a special language of their own.



Write

- Can you understand the sounds of some animals? Which animals?
- Do some animals understand your language? Which ones?

Say it with sounds

Just like birds and dolphins you can also make your own language of sounds for giving messages. Remember you have to talk to your friends with only sounds and no words. How and when will you need to give an alarm call? For example, when the teacher is coming to the classroom!

Sleeping-waking

Some animals go into a long, deep sleep in certain seasons. Then they are not seen for many months.

- Have you noticed that during the cold season you cannot see any lizard in the house? Where do you think they have gone?

Teacher's Note : The lesson gives examples of several animals with 'sensitive' senses. Encourage children to find out more such animal senses from newspapers, TV programmes, etc.

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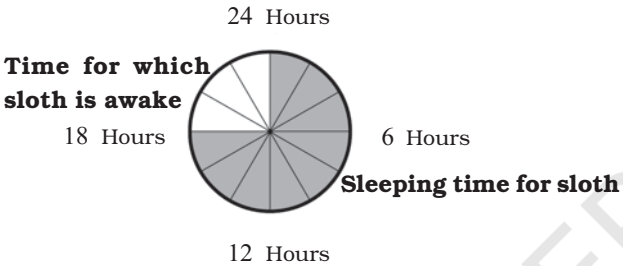
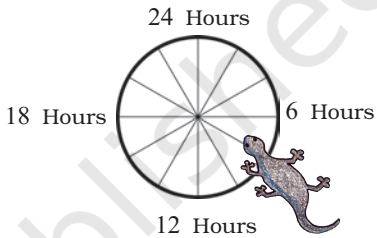
Sloth

It looks like a bear but is not. It is a sloth. It spends almost 17 hours a day sleeping while hanging upside down on a tree branch. The sloth eats the leaves of the same tree on which it lives. It hardly needs anything else. When it has eaten enough leaves from that tree, it moves to the nearby tree.

Sloths live for about 40 years and in that time they move around only eight trees. Once a week it comes down from the tree to relieve itself.

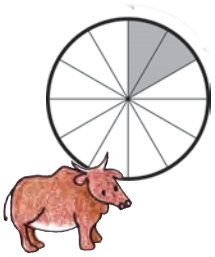


If you were to show a sloth's daily routine (sleeping and waking) in a 24-hour clock, this is what the clock would look like.

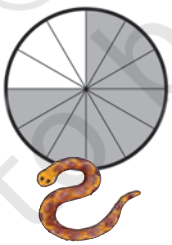


How will you show the clock for a house-lizard in winters?

Given here is the sleeping time of some animals. Write below each picture for how many hours a day that animal sleeps.

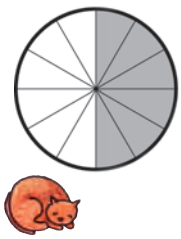


Cow_____



Python_____

Giraffe_____



Cat_____

- When you see different animals, do you have any questions about them? Make a list of ten such questions.

Teacher's Note : The sleeping and waking routine of animals is given in a 24 hour clock to encourage children to think about fractions (one-third, one-fourth, etc.) Explain phrases like 'call of nature', 'relieve itself' etc.

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A tiger can see six times better at night than most of us.

The tiger's whiskers are very sensitive and can sense the movements or vibrations in air. They help the tiger move in the dark and find its prey.

A tiger's sense of hearing is so sharp that it can make out the difference between the rustling of leaves and the sound of an animal moving on the grass. The ears of the tiger can move in different directions and this helps to catch the sounds from all around.

Tigers make different sounds for different purposes like when it is angry or to call out to a tigress. It can also roar or snarl. It's roar can be heard upto 3 kilometres away.

Each tiger has its own area which may cover several kilometres. Tigers mark their area with their urine.

A tiger can at once come to know if there is another tiger in its area by the smell of the urine. A tiger will avoid going into another tiger's area.

The tiger is one of the most alert animals. And yet, today tigers are in danger.

- What do you think are some of the dangers to tigers in the jungle?
- Can human beings also be a threat to animals? How?

Do you know that today many animals are killed and their parts are sold? Elephants are killed for their tusks, rhinoceros for its horn, tigers, crocodiles and snakes for their skins. Musk deer are killed just to make a little scent from its musk. People who kill animals are called hunters and poachers.

The number of tigers and many other animals in our country is reducing. There is a danger that some of them will soon disappear. To protect the animals, our government has made some forests as protected areas. Some of them are the Jim Corbett National Park in Uttrakhand and 'Ghana' in Bharatpur district of Rajasthan. In these areas nobody can hunt animals or destroy the jungle.

Find out

- Where are other such National Parks in India?
- Collect information on these and write a report.

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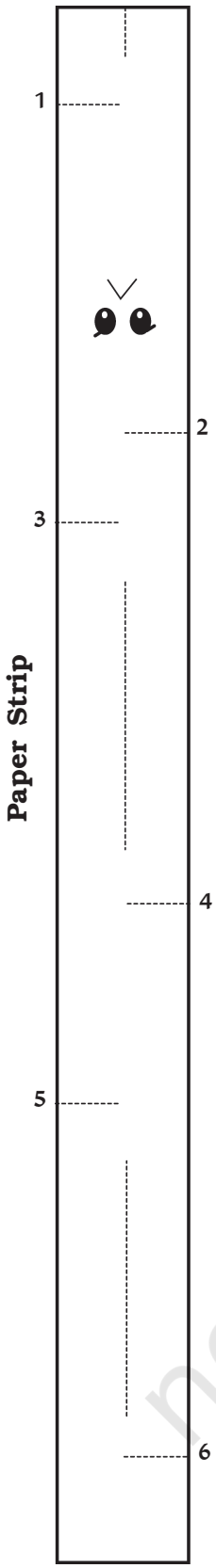
What we have learnt

- Have you noticed that sometimes singers put their hand on their ear when they sing? Why do you think they may be doing this?
- Give examples of animals that may have a very strong sense of sight, hearing or smell.

Teacher's Note : Discuss with children the various threats to the tiger–poaching, destruction of forests for roads, dams, human settlements, forest fires, etc.



Let's make a paper dog

For this you need: thick paper, pencil, scissors, sketch pen.

- Cut a long strip of thick paper. Mark the strip as shown here.
- Make small cuts on the lines marked 1 to 6.
- Hook together the cuts on the number 1 and 2 (see picture a).
- In the same way, hook together 3 in 4, and 5 in 6 (see picture b and c)
- Make a cut in the mark on the leg (see picture c).
- Turn down the corners of the strip on top of the head, to make the ears (picture d)
- Mark the eyes and nose with a sketch pen.

Wasn't that fun!

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2. A Snake Charmer's Story

0529CH02

I am Aryanath

I can do something special which I am sure none of you can do! Do you know what? I can play the *been*! You must be surprised. Yes, I can make snakes dance by playing the *been*. I have learnt this art from my family members. We people are known as *Kalbeliyas*.

My grandfather Roshan Nathji was famous amongst our people. He could easily catch many poisonous snakes. He tells me many stories about his past. Come, listen to his story in his own words–

NAAG GUMPHAN

Designs of this kind are used in rangoli, embroidery and as wall decoration in Saurashtra, Gujarat and South India

Teacher's Note : Talk to the children about their experiences related to snakes before starting with this narrative. This would make the lesson more interesting.

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Dadaji remembers

From the time of my grandfather and great grandfather, we have always been *saperas* (snake-charmers). Snakes have been an important part of our life. We used to move from village to village carrying our snakes in bamboo baskets. Whenever we stopped in a village, a crowd would gather around us. We would then take out our snakes from our baskets.

Even after the show, people would stay on. They knew that in our tinbox there were many types of medicines for them. We made these medicines from plants collected from the forests. I had learnt all this from my grandfather. I felt nice that I could help people with my medicines even if doctors and hospitals were far off. In return, people would give us some money or foodgrains. In this way we could manage our life.

Sometimes, I was called to places where someone had been bitten by a snake. From the marks of the bite I tried to find out which snake had bitten the person. I would then give a medicine for that. But I have not always been on time to help. As you know, some snake bites can even cause death on the spot. But most of the snakes are not poisonous.

Sometimes, when some farmers would come running for help shouting "snake, snake", I would catch that snake.

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After all, catching snakes was something I had been doing since my childhood.

Oh, those were the good days. We could help a lot of people in many ways. We also entertained them. It was not like today when everyone watches TV for entertainment.

When I grew older, my father taught me how to remove their poisonous teeth (fangs). He also taught me how to close the tube of poison in the snake's mouth.

Think and tell

- Have you ever seen anyone playing a *been*? Where?
- Have you ever seen a snake? Where?
- Were you scared by it? Why?
- Do you think all snakes are poisonous?
- In chapter 1 you read that snakes do not have ears which you can see. Can the snake hear the *been* or does it dance when the *been* moves? What do you think?

What can we do

Aryanath! your father used to travel with me ever since he was a young child. He learnt to play the *been* without being taught.

These days it is diffcult. Now the government has made a law that no one can catch wild animals and keep them. Some people kill the animals and sell their skins at high prices. So they made a law against this. Now, with this law, how will we earn our livelihood? We people have never killed snakes, and sold their skin. People say that we keep the snakes in bad

Teacher's Note : If possible, explain about poisonous fangs, ducts and their removal by showing visual aids.

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conditions. If we wanted, we too could have earned a lot of money by killing snakes. But we would never do that. Snakes are our treasure, that we pass on from one generation to another. We even gift snakes to our daughters when they get married. In our *Kalbelia* dance we also have movements similar to the dance of the snake. Aryanath, you will have to make a different life for yourself. You have got your father's gift of playing the *been*. You and your cousins can form a *been* party and entertain people.

Pankaj Gorana

Musical instruments used in been party
Been, tumba, khanjiri and *dhol*. Except *dhol* all the other three instruments are made from dried gourd (*lauki*)

But do not waste this knowledge about snakes you have got from your elders.

Share your knowledge about snakes with children who live in towns and cities. Tell them, that they should not be scared of snakes. Help them to recognise poisonous snakes.

Tell them how snakes are friends of the farmers. They eat the rats in the fields, otherwise rats would eat the crops.

Now you tell our story. Also make a new story of your life, to tell your grandchildren.

Mani Babbar

***Kalbeliya* dance**

Teacher's Note : This narrative focuses on the relationship and interdependence between snake-charmers and snakes. By talking about more such communities it can be clarified that most of them do not treat animals badly (which is a common perception). We should also not hurt/tease animals.

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Write

- Have you ever seen animals being used for entertainment of people? (For example, in a circus, on the road, or in a park)
  - When and where did you see this?
  - Which animal show did you see?
  - How did people behave with the animals in the show?
  - Was anyone teasing the animals? How?
  - What kind of questions came to your mind after seeing that animal show?

Imagine that you are an animal in a cage. Think how you would feel. Complete the following sentences :

- I am afraid when _____
  _____
- I wish I _____
  _____
- I am sad when _____
  _____
- If I had a chance I would _____
  _____
- I do not like it at all when _____
  _____

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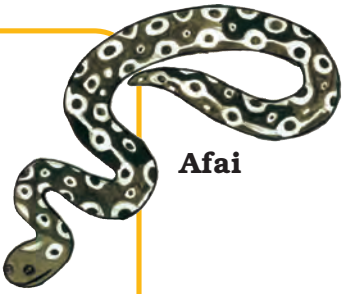
Do you know?

Of the many kinds of snakes found in our country, only four types of snakes are poisonous. They are: Cobra, Common Krait, Russel's Viper (Duboiya), Saw-scaled Viper (Afai).

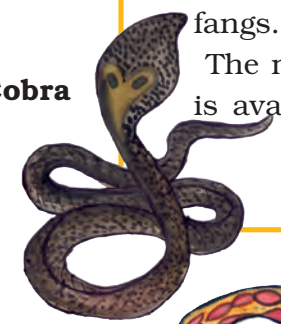
A snake has two hollow teeth (fangs). When it bites, the poison enters the person's body through the fangs. There is a medicine for snake bites.

The medicine is made from the snake's poison and is available in all government hospitals.

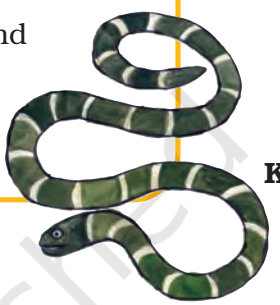


Afai

Cobra



Duboiya



Krait

Write

- Like snake-charmers, which other people depend on animals for their livelihood?

_____

_____

Survey–People who keep animals

Talk to some people in your neighbourhood who keep one or more animals for their livelihood–for example, a horse for a tonga, hens for eggs, etc.

- Name the animal they keep?
- How many animals are there?
- Is there a separate place for the animals?

Teacher's Note : Make crossword Puzzles on animals and ask them to collect more details of these animals and discuss.

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- Who looks after them?
- What do the animals eat?
- Do the animals ever fall ill? What does the keeper do then?
- Make some more questions and discuss.
- Make a report on your project and read it out in the class.

Make a snake puppet

- Take an old pair of socks.
- Put one on your arm.
- Stick buttons or *bindis* for the eyes.
- Cut out a long red strip of paper for using as the tongue and stick it in the place as shown.
- On the other side of the paper make a 'V' shaped cut.
- Your snake is ready!

Now you can play with this puppet!

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What we have learnt

The government has made a law that no one can catch and keep snakes. What do you think about this law? Give reasons for your answer and write in your own words.

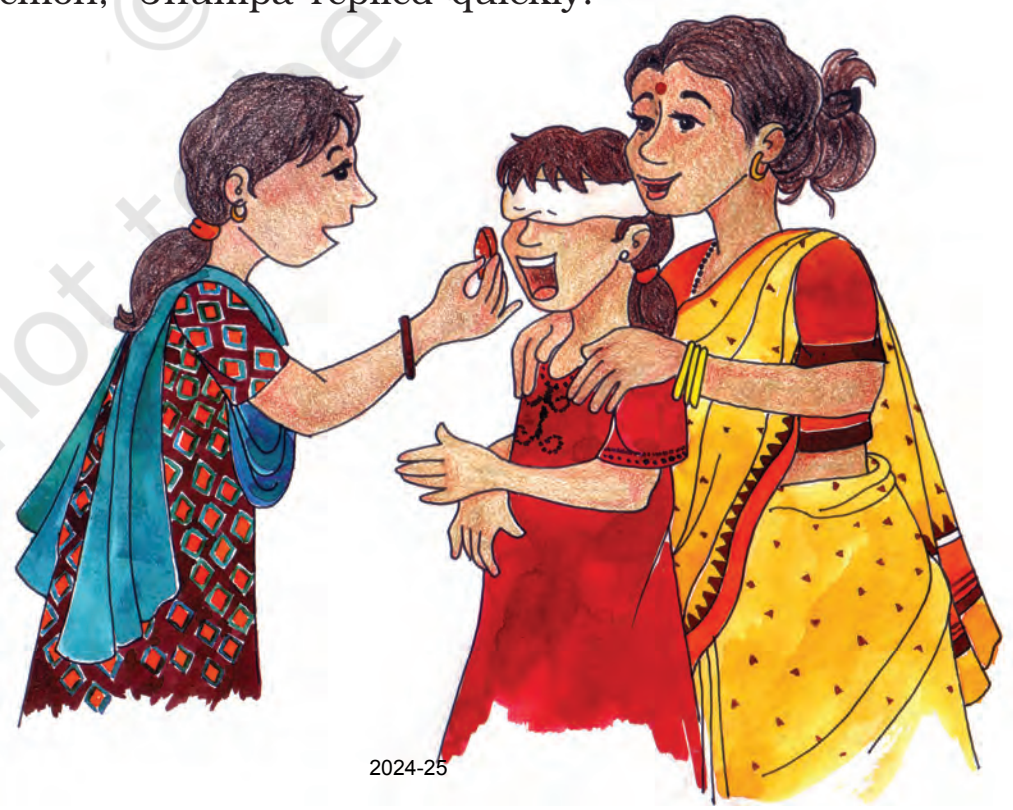
0529CH03

3. From Tasting to Digesting

Different tastes

Jhumpa ran into the kitchen and caught hold of her mother saying, "Ma, I am not going to eat this bitter *karela* (bittergourd). Give me *gur* (jaggery) and *roti*." Ma smiled and said, "You ate *roti* and sugar in the morning." Jhoolan teased Jhumpa, "Don't you get bored of only one kind of taste?" Jhumpa replied quickly, "Do you get bored with licking *imli* (tarmarind)? I bet your mouth is watering just by hearing the word *imli*." "Sure I love the sour *imli*. But I eat sweet and salty things too. I even eat *karela*," said Jhoolan and looked at her mother. They both laughed heartily.

Jhoolan said to Jhumpa, "Let's play a game. You close your eyes and open your mouth. I will put something to eat in your mouth. You have to tell what it is." Jhoolan took a few drops of lemon juice in a spoon and put them in Jhumpa's mouth. "Sour lemon," Jhumpa replied quickly.



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Jhoolan then picked up a small piece of jaggery. Her mother suggested, "Crush it, otherwise she will know what it is?" Jhoolan crushed the jaggery but Jhumpa easily guessed it. They played the game with different food items. Jhumpa could tell the fried fish even before tasting it. Jhoolan said, "Now close your nose, and tell me what this is?" Jhumpa was confused, "It is a bit bitter, a little salty and somewhat sour. Give me one more spoonful." Jhoolan took another spoonful of the cooked *karela,* uncovered Jhumpa's eyes, and said, "Here it is, eat!" Jhumpa laughed, "Yes, give me more."

Discuss and write

- Jhoolan's mouth started watering when she heard the word *imli*. When does your mouth water? List five things you like to eat and describe their taste.
- Do you like only one kind of taste or different ones? Why?
- Jhoolan put a few drops of lemon juice in Jhumpa's mouth. Do you think we can make out the taste with just a few drops?
- If someone were to put a few seeds of *saunf* (aniseed) on your tongue, would you be able to tell with your eyes closed? How?

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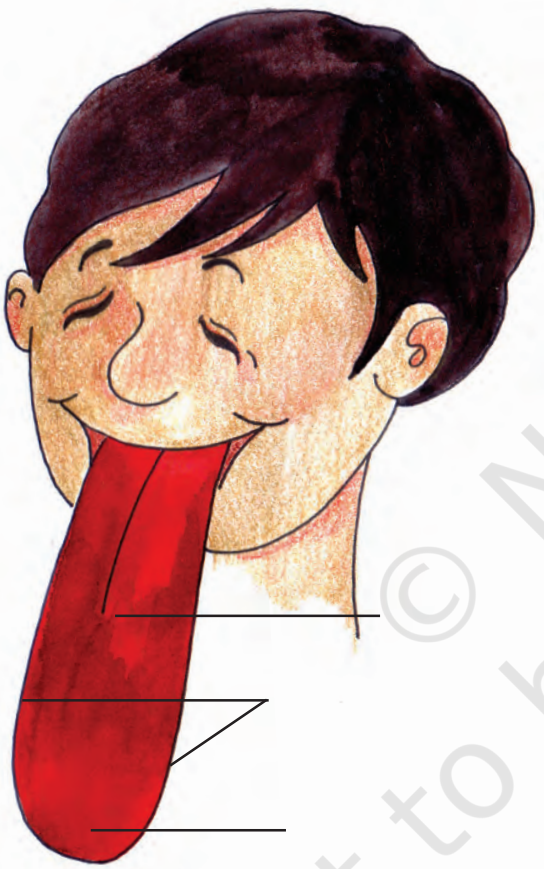
- How did Jhumpa make out the fried fish? Can you guess the names of certain things only by their smell, without seeing or tasting them? What are these things?

- Has anyone ever told you to hold your nose before taking a medicine? Why do you think they tell you to do this?

Close your eyes and tell

Collect a few food items having different kinds of taste. Play a game with your friends like Jhumpa and Jhoolan did. Tell your friend to taste the food and ask–

- How did it taste? What was the food item?
- On which part of the tongue could you get the most taste – in front, at the back, on the left or right side of the tongue?
- Which taste could be made out on which part of the tongue? Mark these parts on the picture given.
- One at a time put some things to eat in other parts of your mouth – under the tongue, on the lips, on the roof of the mouth. Did you get any taste there?



Label the parts of the tongue

Teacher's Note : Encourage children to be creative and to explore their vocabulary to describe different kinds of flavours. Discuss how the combination of different flavours brings so much variety in our food. Different combinations of taste (such as sweet-sour, hot-spicy) may be discussed in the class to develop this understanding.

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Use a clean cloth to wipe the front part of your tongue so that it is dry. Put some sugar or jaggery there. Could you taste anything? Why did this happen?

- Stand in front of a mirror and look closely at your tongue. How does the surface look? Can you see any tiny bumps on the surface?

Tell

- If someone asks you to describe the taste of *amla* or cucumber, you might find it difficult to explain.

- How would you describe the taste of these – tomato, onion, *saunf*, garlic.

- Think of words that you know or make up your own words to describe the taste.
- When Jhumpa tasted some of the things, she said "Sssee, sssee, sssee..."
- What do you think she may have eaten?

- Why don't you make sounds that describe some tastes?
- From your expressions and sounds ask your friends to guess what you might have eaten.

Chew it or chew it well: What's the difference?

Try this together in class:

- Each of you take a piece of bread or *roti* or some cooked rice.

Teacher's Note : Children will need help because it is sometimes difficult to identify exactly which part of the tongue can sense a particular taste.

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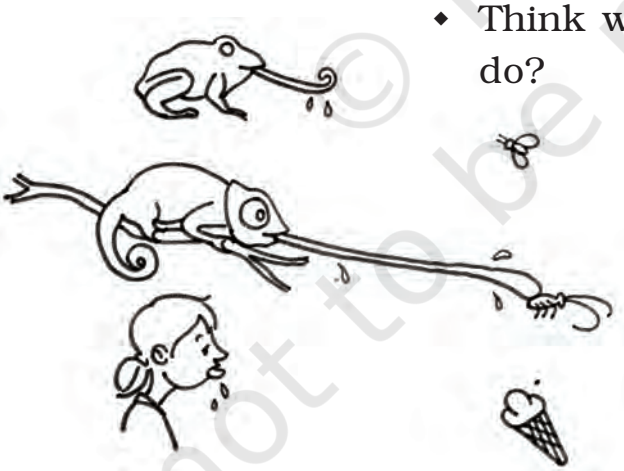
- Put it in your mouth, chew three to four times and swallow it.
- Did the taste change as you chewed it?
- Now take another piece or some rice and chew it thirty to thirty-two times.
- Was there any change in the taste after chewing so many times?

Discuss

- Has anyone at home told you to eat slowly and to chew well so that the food digests properly? Why do you think they say this?
- Imagine you are eating something hard like a green guava. What kinds of changes take place in it–from the time you bite a piece and put it in your mouth to when you swallow it?
- Think what does the saliva in our mouth do?



Teacher's Note : On page 27, children are not expected to draw the 'digestive system.' Encourage children to imagine and express their own ideas about what happens to the food in their body. Encourage sharing of pictures and free discussion, without any judgement of right or wrong.

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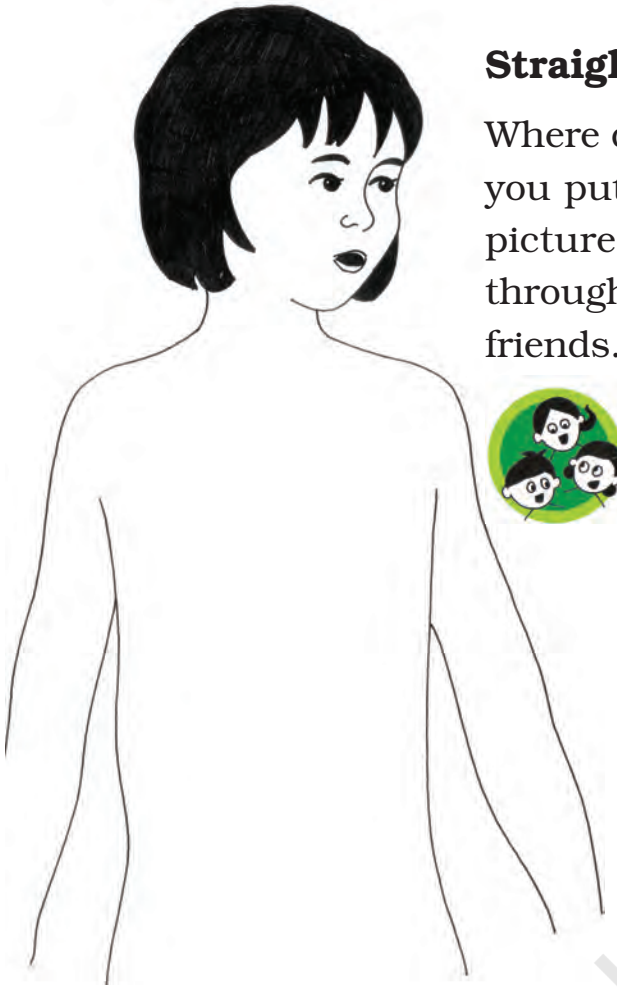
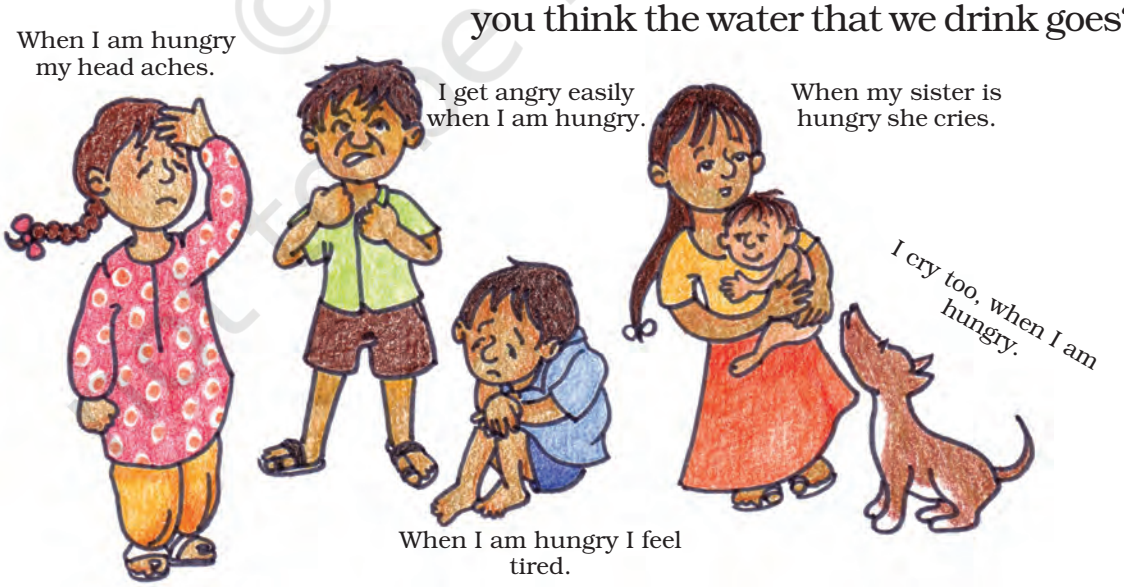


Straight from the heart

Where do you think the food must be going after you put it in your mouth and swallow it? In the picture given here, draw the path of the food through your body. Share your picture with your friends. Do all of you have similar pictures?

Discuss

- How do you feel when you are very hungry? How would you describe it? For example, sometimes we jokingly say, "I am so hungry I could eat an elephant!"
- How do you come to know that you are hungry?
- Think what would happen if you do not eat anything for two days?
- Would you be able to manage without drinking water for two days? Where do you think the water that we drink goes?



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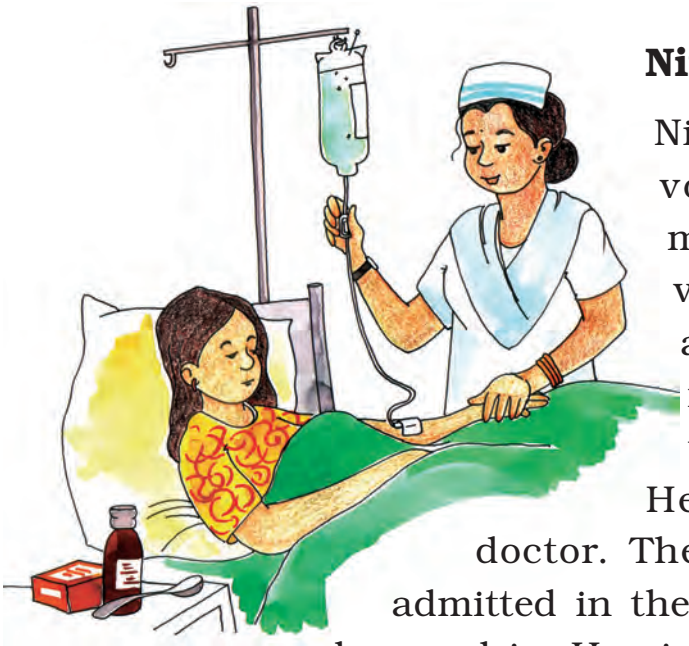

Nitu was given a glucose drip

Nitu was very sick. All day she was vomiting and she also had loose motions. Whatever she ate, she vomited. Her father gave her sugar and salt solution. By evening Nitu was feeling weak and dizzy. When she got up to go to the doctor she fainted. Her father had to carry her to the doctor. The doctor said that Nitu should get admitted in the hospital. She needs to be given a glucose drip. Hearing this, Nitu got confused. She knew that during the games period in school, the teacher sometimes gave them glucose to drink. But what was a glucose drip? Doctor aunty explained, "Your stomach is upset. Your body is not keeping any food and water and it has become very weak. The glucose drip will give you some strength quickly, even without eating."

Talk and discuss

Do you remember that in Class IV you made a solution of sugar and salt? Nitu's father also made this and gave her. Why do you think this is given to someone who has vomiting and loose motions?

- Have you heard the word 'glucose', or seen it written anywhere? Where?

Teacher's Note : Discuss with children about how glucose is used. It is too abstract for children to understand how glucose gives energy. You may like to invite a doctor to talk to the children. It is not expected that children will understand all the details at this stage.

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- Have you ever tasted glucose? How does it taste? Tell your friends.
- Have you or anyone in your family been given a glucose drip? When and why? Tell the class about it.
- Nitu's teacher used to tell the girls to have glucose while playing hockey. Why do you think she did this?
- Look at Nitu's picture and describe what is happening. How is the glucose drip being given?

Martin's Window

Here's an old story
it seems so funny!
There was a window
in Martin's tummy!

Actually by mistake
Martin was shot.
Right in the stomach
it bled a lot!

The wound slowly healed
and was covered by skin.
But the hole was still there
you could peep right in!

Oh! what a chance
for doctors to study.
What happens to the food
inside the body!

The story seems odd
but it is really true.
The secret of Martin's stomach
helped us all - me and you!

– Rajesh Utsahi
Chakmak, August 1985
(Translated by Anupa Lal)

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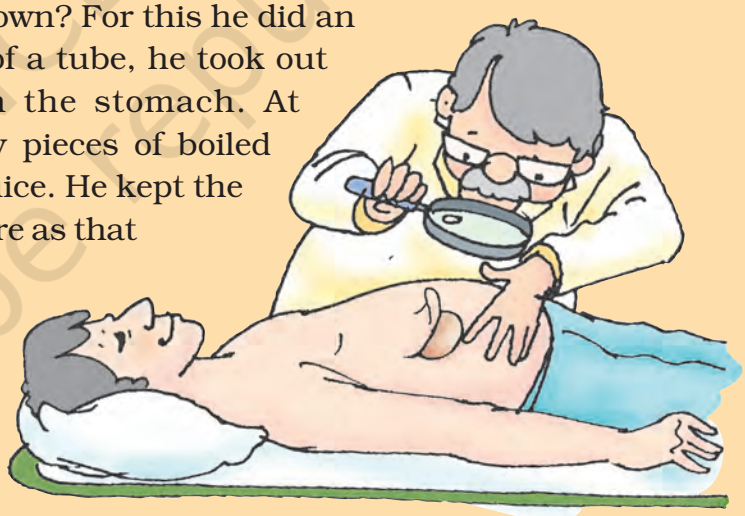
Story – A Stomach with a Window

In the poem, you read about a soldier called Martin. In 1822, he was eighteen years old and was very healthy. When he was shot, he got seriously hurt. At that time Dr. Beaumont was called to treat him. Dr. Beaumont cleaned the wound and put the dressing. After one and a half years, the doctor found that Martin's wound had healed except for one thing. He had a big hole in his stomach. The hole was covered with a loose flap of skin, like the washer in a football. Press the skin and you could peep into Martin's stomach! Not only that, the doctor could also take out food from the stomach by putting a tube in the hole. Dr. Beaumont felt he had found a treasure. Can you guess how much time he spent on doing different experiments on this stomach? Nine years! During this time Martin grew up and got married.

At that time scientists did not know how food was digested? How does the liquid (digestive juices) in the stomach help? Does it only help in making the food wet and soft? Or does it also help in digestion?

Dr. Beaumont took some liquid (juices) out of the stomach. He wanted to see what would happen to a food item kept in a glass filled with it. Would it get digested on its own? For this he did an experiment. With the help of a tube, he took out some digestive juice from the stomach. At 8.30 am he put twenty tiny pieces of boiled fish in 10 millilitres of the juice. He kept the glass at the same temperature as that of our stomach – about 30°C. When he checked at 2 pm he found that the pieces of fish had dissolved.



Dr. Beaumont tried this experiment with different food items. He gave Martin the same food at the same time and then compared how long it took for food to be digested in the glass and in Martin's stomach. He recorded his observations in a table.

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Here is a part of his observation table:

No.	Food item	Time taken for digestion	
		In the stomach	In the glass with digestive juices
1.	Unboiled milk	2 hours 15 minutes	4 hours 45 minutes
2.	Boiled milk	2 hours	4 hours 15 minutes
3.	Full boiled egg	3 hours 30 minutes	8 hours
4.	Half boiled egg	3 hours	6 hours 30 minutes
5.	Raw egg, beaten	2 hours	4 hours 15 minutes
6.	Raw egg	1 hour 30 minutes	4 hours

So, what does our stomach do?

Dr. Beaumont did many experiments and found out many secrets about digestion. He found that food digests faster in the stomach than outside. Did you notice this in the table?

Our stomach churns the food to digest it. The doctor also saw that the food did not digest properly when Martin was sad. He also found that the juice in our stomach is acidic. Have you heard of anyone talking about acidity – especially when that person has not eaten well or the food is not digested properly.

Dr. Beaumont's experiments became famous across the world. After this many scientists did many such experiments. What did you say? No, they did not shoot people in the stomach. Nor did they wait for a patient with a hole in the stomach. They used other scientific ways to look inside our bodies.

Did you like the story of Martin or, should we say, the story of our own stomach?

- Anita Rampal
Chakmak, August 1985

Think and discuss

Imagine if you had been in place of Dr. Beaumont, what experiments would you have done to find out the secrets of our stomach? Write about your experiments.

Teacher's Note : This story is to introduce children to the method of science and the passion with which scientists pursue their experiments. It is not necessary that children should understand the story about digestion in all its detail.

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Good food, good health

Dr. Aparna has two patients – Rashmi and Kailash. Dr. Aparna talked to them to find out more about them. Read what the doctor found.

Rashmi, 5 years

She looks about 3 years old. She has very thin arms and legs and a pot belly (stomach like a balloon). She often falls sick.

She always feels tired and cannot go to school regularly. She does not have the strength even to play.

Food : She is lucky if she can get a little rice or one *roti* to eat in the whole day.

Kailash, 7 years

He looks older than his age. His body is fat and flabby. He has pain in his legs. He is not very active. He goes to school by bus and spends many hours watching TV.

Food : He does not like to eat home-cooked food like *dal*-rice, vegetables and *roti*. The only thing he finds tasty are chips, burger, pizzas and soft drinks from the market.

Dr. Aparna measured the height and weight of both the children. Then she told them, there is only one treatment for both your problems – proper food!

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Discuss

- Why do you think Rashmi could eat only one *roti* in the whole day?
- Do you think Kailash would like games and sports?
- What do you understand by 'proper' food?
- Why do you think that the food of Rashmi and Kailash was not proper?

Find out

Talk with your grandparents or elderly people and find out what they ate and what work they did when they were of your age.

– Now think about yourself – your daily activities and daily diet.

– Are these similar or different from what your grandparents did and ate?

Proper food – every child's right?

You have read about two children. One is Kailash who does not like home-made food. The other one is Rashmi who does not even get one proper meal a day. About half the children in our country are like Rashmi. They do not get enough food that they need to grow and develop properly. These children are weak and sickly (often ill, in poor-health). But it is the right of every child to get proper food.

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Think and discuss

- Do you know any child who does not get enough to eat in the whole day? What are the reasons?
- Why do you think people suffer from starvation?
- What kind of health problems occur when we do not get enough food for a very long time?
- Where do the grains from the field go after reaching the mandis?
- Have you come across any news related to huge spoilage in mandis or godowns? Collect some news of food spoilage or wastage on a large scale in mandis or godowns.
- Read the news and find out the reasons of spoilage of grains. How can such incidents be checked?

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4. Mangoes Round the Year

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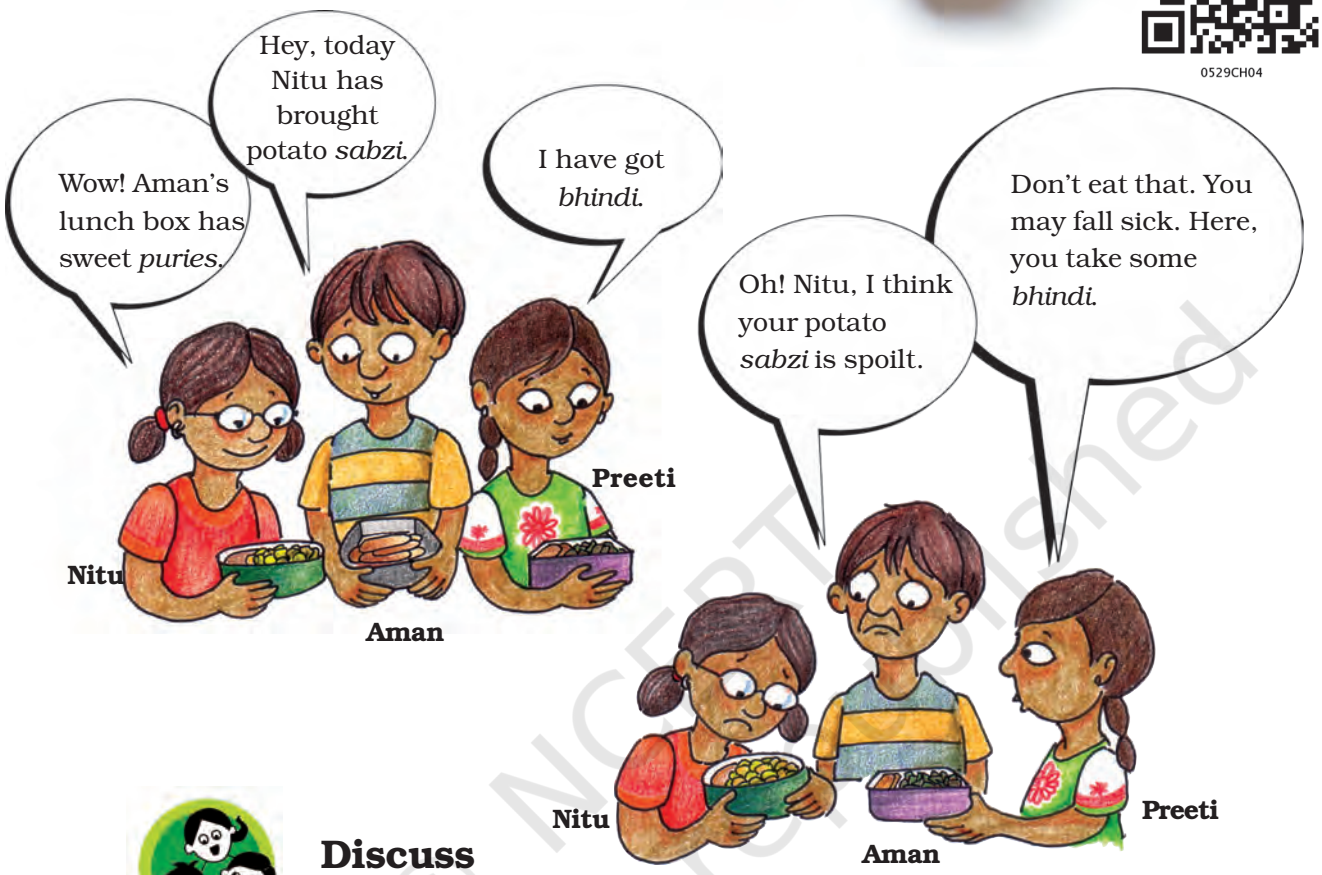

Discuss

- How did Aman know that the potato *sabzi* had got spoilt?
- Have you ever seen some food that has got spoilt? How did you know that it was spoiled?
- Preeti told Nitu not to eat the potato *sabzi*. What would have happened if she had eaten it?

Teacher's Note : Let children give examples of food spoilage based on their own experiences. It is important to explain the difference between food spoilage and wastage of food. The experiment with bread can be started when you begin the lesson, because it will need to continue over six days at least.

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Write

- Look in your kitchen and write down names of food items that
  - can get spoilt in 2-3 days _____ _____ _____
  - can be kept for a week _____ _____ _____
  - would not spoil till one month _____ _____ _____
- Look at your friend's list and discuss in the class.
- Will your list be the same in all seasons? What would change?
- When food gets spoilt in your house, what do you do with it?

Biji returned the bread

Aman's Biji went to the market to buy bread. The shop was very crowded. The shopkeeper picked up a packet of bread and gave it to Biji. She looked at it and returned it immediately.

- Look at the picture of the bread packet here and guess why Biji returned it?
- How did she find that the bread had got spoilt?

Find out

Look carefully at two-three packets of food items:

- What can we know from what is written on the packet?
- When you buy anything from the market, what do you look for on the packet?

Teacher's Note : Help children to read and note the information on the packets regarding weight, date of packing etc. While doing the experiment precautions need to be taken depending on the weather conditions – e.g. the bread should not be allowed to dry up, there should be some ventilation in the room. Do put up the chart in the classroom and remind the children to fill it in every day.

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How does food get spoilt?

The whole class can do this experiment together. Take a piece of bread or *roti*. Sprinkle a few drops of water on it, and put it in a box. Close the box. See the bread or *roti* everyday until you find some changes on it.

Make this table on a chart paper and put it up in the classroom. Fill up the chart every day after discussing the changes seen.

Day	Changes in the bread or *roti*			
	By touch	By smell	By looking through hand lens	By colour
1.				
2.				
3.				
4.				
5.				
6.				

- Find out the reason for these changes. From where did the fungus come on the bread?
- Different kinds of food items spoil due to different reasons. Some foods spoil soon, some stay good for long. List some seasons and conditions in which food spoils quickly.

Teacher's Note : Whenever children do this experiment, they should wash their hands after the experiment.

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- Given below are some food items and some simple methods by which these could be kept fresh for 1-2 days. Match the correct pairs:

Food items	Methods
Milk	Put in a bowl and keep the bowl in a container with some water.
Cooked rice	Wrap in a damp cloth.
Green coriander (*Dhania)*	Boil it.
Onion, garlic	Keep it in a dry open place.

Summer treat – *Mamidi tandra*

Chittibabu and Chinnababu live in Atreyapuram town in Andhra Pradesh. The brothers spend the summer holidays playing in the mango garden, when the trees are full of fruits. They also like to eat unripe mangoes with salt and chilly powder.

At home, their mother cooks unripe mangoes in different ways. She also makes many kinds of mango pickles. The pickles last through the year until the next mango season.

One evening, while having food Chinnababu asked, "*Amma*, we have so many mangoes. Make some *mamidi tandra* (*aam papad*) from them."

Their father said, "Making *mamidi tandra* needs four weeks of hardwork. If you both promise to help us everyday for the next four weeks, we can together make the *mamidi tandra*."

Both the brothers quickly agreed to help. The next day both the children went to the market with their father. They bought a mat woven from the leaves of a palm tree, poles of casuarina tree, string made of coconut husk, some jaggery and sugar.

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Amma found a sunny place in the backyard. Both the brothers made a high platform by using poles. They spread out and tied the mat on that platform.

The next day, *Appa* chose the most ripe mangoes. They took out the mango pulp into a large pot. Then they strained the pulp through a fine muslin cloth, to remove the fibres from the pulp. Then Chittibabu crushed the *gur* (jaggery) till there were no lumps. They added the jaggery and sugar in equal amounts

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to the pulp. Chinnababu mixed the jaggery and sugar well with a big spoon. *Amma* then spread this pulp into a thin layer over the mat. The thin layer was left to dry in the sun. In the evening, they covered the mat with a clean saree to avoid any dust.

The next day they again took out some mango pulp. They added jaggery and sugar into the pulp. Then they spread the pulp over the previous day's layer. This work was given to both the brothers. Both of them together spread many layers over it. For the next four weeks they hoped that it would not rain.

For four weeks, they added layer after layer until the jelly grew four centimetres thick and looked like a golden cake. After some days *Amma* said, "The *mamidi tandra* is ready, we can take it out and cut it into pieces tomorrow."

The next day, the mat was brought down from the platform. *Mamidi tandra* was cut into smaller pieces. The brothers tasted it. It was tasty. Chhinnababu said, "Wow, how tasty! After all we have also helped in making it."

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Write

- Why was sugar and jaggery mixed into the mango pulp and dried in the sun?
- Why did *Appa* first choose the most ripe mangoes to be used for making the *mamidi tandra*?
- How did the brothers make the *mamidi tandra*? Write down step-by-step what they did for this.
- What things are made in your house from ripe and unripe mangoes?

- Make a list of all the different types of pickles that you know about, and share with your friends.

Find out and discuss

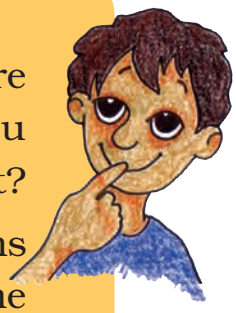
- Is there any kind of pickle made in your house? What kind of pickle is it? Who makes it? From whom did they learn to make the pickle?
- What all things are needed to make any one type of pickle in your house? How is the pickle made? Find out the recipe and write.

- How are these things made in your house.

  • *Papad* • *Chutney* • *Badiyan* • *Sauce*

- It is a two-day journey by train from Pune to Kolkata. If you were to go on this trip, what food items would you carry with you? How would you pack them? Make a list on the blackboard of all the packed food. What food would you eat first?

What we have learnt



- Glass jars and bottles are dried well in the sun before filling them with pickles. Why is this done? Do you remember what happened to the bread in the experiment?
- To eat mangoes round the year we make different items like pickle, *aam papad*, *chutney*, *chikky*, etc. List some other food with which we make different things, so that we can enjoy it throughout the year.

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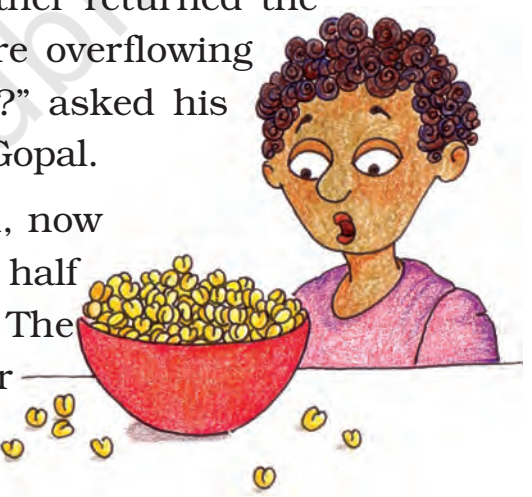
0529CH05

5. Seeds and Seeds

Gopal was waiting for his mausi's family to visit them. They will be coming the next day for their holidays. He was thinking about all the fun and nice food that he would have with his cousins. Just then his mother called out, "Gopal, before you sleep, remember to soak two small bowls (*katoris*) of *chana* (gram)." She was going to his Bua's house and would return only in the morning.

As he was soaking the *chana*, Gopal thought, "How will two small bowls of this be enough for eight persons?" So he soaked another two bowls of *chana*. When his mother returned the next morning, she saw that the *chana* were overflowing from the vessel. "How much did you soak?" asked his mother. "How did that happen!" wondered Gopal.



"You soaked too much! Anyway it is good, now I will cook half of them, and leave the other half to sprout. I can send these to your aunt. The doctor has told her to eat sprouts", mother said. She tied half of the soaked *chana* in a wet cloth, and hung them up to sprout.

Discuss

- What things are soaked before cooking in your house? Why?
- What things do you eat after sprouting? How are they sprouted? How much time does it take?
- Has the doctor or someone you know ever told you to eat sprouts? Why?

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Do this and find out

Do you remember that in Class IV you did an activity with seeds? Now try another one.

- Take some *chana* and three bowls.
- Put five *chana* in the first bowl and fill it up with water.
- Put a damp piece of cloth or some cotton wool in the second bowl. Now keep the same number of *chanas* in it. Make sure that the cotton wool or cloth remains wet.
- Put the same number of *chanas* in the third bowl. Do not put anything else in it. Cover all the three bowls.

Observe after two days and note the changes in the bowls.

	Bowl 1	Bowl 2	Bowl 3
Are the seeds getting air?	No	Yes	Yes
Are the seeds getting water?			
What changes did you see?			
Have the seeds sprouted?			

Tell and write

- In which bowl did the seeds sprout? What difference did you see between this bowl and the other bowls?
- Why did Gopal's mother tie the *chana* in a damp cloth?

Teacher's Note : Sprouting time of seeds may vary according to the temperature and humidity of the weather.

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When you split the whole *masoor*, you get me – *masoor dal*. But then you cannot sprout me! Can you think why?

Draw

- Look carefully at your sprouted *chana* and make its drawing?

Project : Plant your seeds

Take a clay pot or a tin can with a wide mouth. Make a small hole at the bottom of the can. Fill your can with soil. Put four or five seeds of the same kind in the soil and press them gently. Different groups can plant different kinds of seeds, such as mustard (*sarson*), fenugreek (*methi*), sesame (*til*) or coriander (*dhania*).

Write

Name of the seed : _____

The date on which you planted them: _____

The day you observe something coming out of the soil, start filling the table:

To find the height of a plant use thread and then measure it on the scale.

Date	Height of the plant (in cm)	Number of leaves seen	Any other change

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Find out

- How long did it take for the plant to come out from the soil?
- What was the difference in the height of the plant on the first and second day?
- On which day did the height of the plant increase the most?
- Did new leaves come out of the plant every day?
- Was there any change in the stem of the plant?

Discuss

- Which seeds took the most number of days for the stem to come out of the soil?
- Which seeds took the least days to come out of the soil?
- Which seeds did not grow at all? Why?
- Did anyone's plant dry up or turn yellow? Why did this happen?
- What would happen if the plants do not get water?

Straight from your heart

- What is inside the seed?
- How does a big plant grow from a tiny seed?

Teacher's Note : Students are not supposed to be given formal information in response to these questions. These are meant to explore their own intuitive ideas. Discussion in class will help them think about how plants need air, water and soil.

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Think and imagine

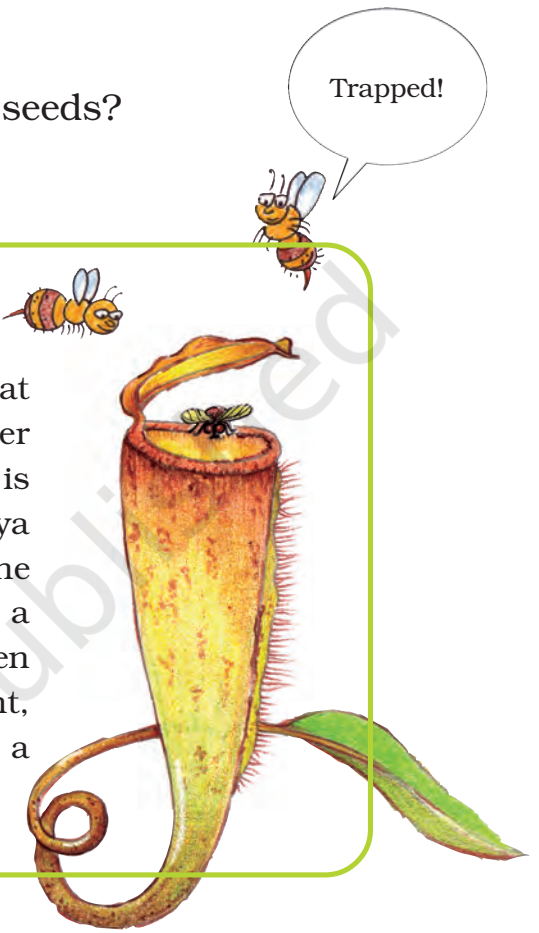
- What would happen if plants could walk? Draw a picture.

Find out

- Do some plants grow without seeds?

Plants which hunt!

There are some plants which trap and eat frogs, insects and even mice. The Pitcher plant (Nepenthese) is one such plant. It is found in Australia, Indonesia and Meghalaya in India. It has a pitcher-like shape and the mouth is covered by a leaf. The plant has a special smell that attracts insects to it. When the insect lands on the mouth of the plant, it gets trapped and cannot get out. What a clever way to hunt!



So many seeds!

How many types of seeds can you collect? Where will you find them? Each of you should try to collect as many different types of seeds as you can. After that, put all the seed collections together. Now observe these seeds carefully – their shapes, sizes, colours, textures (smooth

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or rough). Make a seed chart to put up in the class. You can start with a table like this.

Name of the seed	Colour	Shape (draw)	Texture
Rajma	Reddish brown		Smooth

Think

- Did you keep aniseed (*saunf*) and cumin (*jeera*) in your list?
- Which was the smallest seed and which was the biggest seed in your collection?

Make lists of :

- Seeds that are used as spices in your home.
- Seeds of vegetables.
- Seeds of fruits.
- Light seeds (check by blowing them).
- Seeds which are flat.
- Make more groups. How many groups of seeds did you make?
- Do you know any games that you can play with seeds? Discuss with your friends.

Wandering seeds

Plants cannot move around. Once they grow, they remain in the same place. But their seeds are great travellers! They can reach far and wide. Look at picture 1 on the next page and see the flying seeds.

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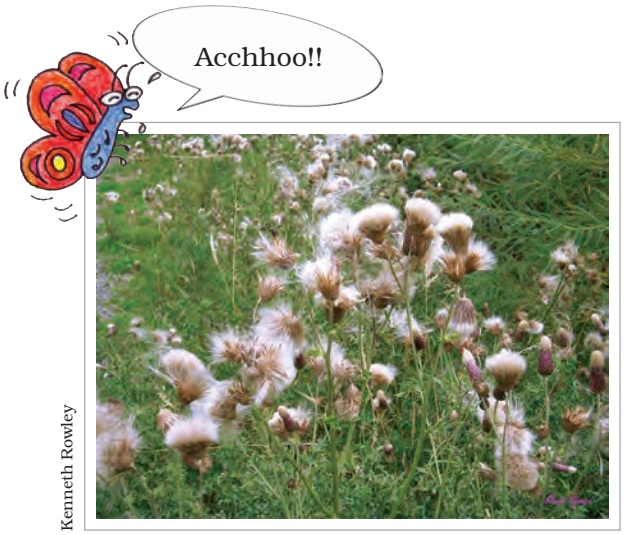
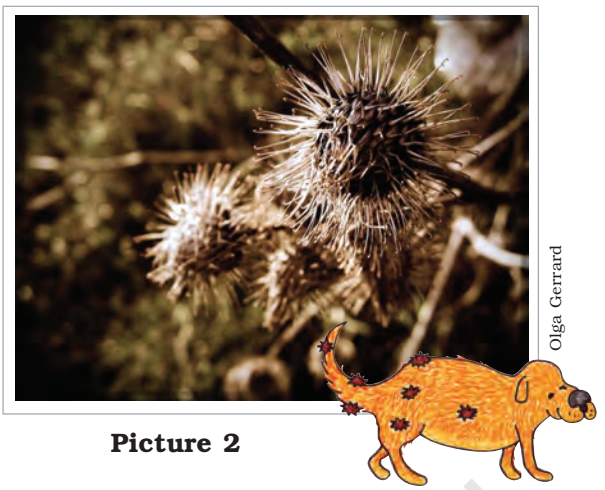


Picture 1



Picture 2

- Have you ever seen any seed that can fly?
- What is it called in your area?
- Look at your seed collection. Guess how many of those could have travelled by flying.

Look at picture 2. This seed cannot fly, but it can still travel by sticking on to the fur of animals or on our clothes. In this way it gets a free ride! Did you get any new idea from these seeds? Read how the idea of Velcro came to George Mestral.

This happened in 1948. One day George Mestral came back from a walk with his dog. He was amazed to find seeds sticking all over his clothes and on his dog's fur. He wondered what made them stick. So he observed these seeds under a microscope. He saw that the seeds had many tiny hooks which got stuck to clothes or fur. This gave Mestral the idea of making Velcro. He made a material with similar tiny hooks that would stick. Velcro is used to stick together many things – clothes, shoes, bags, belts and many more. What a way to take inspiration from nature!

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Look at the pictures given below and guess how the seeds travel and reach different places.

- Some plants spread their seeds over long distances. When the soyabean pods are ripe, they burst and the seeds are thrown out. Have you ever heard their sound?
- Think what would happen, if seeds did not spread and remained at one place only.
- Make a list of the different ways by which seeds are spread.

Who came from where?

Have you included human beings also in your list? Yes, we also carry seeds from one place to another, knowingly or unknowingly. We bring the seeds of plants that we find beautiful or useful, to grow them in our garden. Later the seeds of these plants spread to other places. Many years later people may not even remember that these plants did not grow here earlier. They were brought from somewhere else. Do you know from where chillies came to our country? These were brought to India by traders coming from South America. Today we cannot think of food without chillies!

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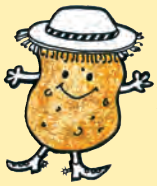
Read this poem to know which plant came from where.

Did you know this?



From South America
long ago,
came a tomato,
a potato,
and a green chilli.

Do you know this?

A cabbage came
from Europe,
and also a pea.
From Africa
came a coffee bean,
and a green *bhindi*.

They crossed the land.
They crossed the sea.

Did you know this?

(*Bhindi* is also called okra, and *methi* is called fenugreek)

A mango sang,
'Come in! Come in!'
An orange smiled
inside its skin.
'Welcome to India,'
a banana said.
the *methi* and spinach,
brinjal and radish,
nodded its head.

Did you know this?
...

– *Rajesh Utsahi*
Chakmak, May-June 2002
(Translated by Anupa Lal)

आलू मिर्ची चाय जी, कौन कहाँ से आए जी! आलू मिर्ची चाय जी, कौन कहाँ से आए जी! आलू मिर्ची चाय जी, कौन कहाँ से आए जी!

आलू मिर्ची चाय जी, कौन कहाँ से आए जी! आलू मिर्ची चाय जी, कौन कहाँ से आए जी! आलू मिर्ची चाय जी, कौन कहाँ से आए जी!

What all was grown in India long ago? Were mangoes and bananas grown here? What came from other countries? Imagine food without potatoes or tomatoes!

What we have learnt

- Reena has drawn this picture of the seed sprouted by her. What do you think the seeds need for sprouting? Write in your own words. How would Reena's seeds look if they did not get the things needed. Show by drawing a picture.
- How do seeds spread to far off places? Write in your own words.

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6. Every Drop Counts

0529CH06

Long Long Ago

This is a picture of *Ghadsisar*. *Sar* means a lake. King *Ghadsi* of Jaisalmer got it made 650 years ago with the help of the people. All around the lake there are *ghats* with steps leading to the water, decorated verandahs, large halls, rooms and much more. People came here to celebrate festivals and for programmes of music and dance. Children came to study in the school on the *ghat*. The *talab* belonged to everyone and everyone took care to keep it clean.

Rainwater collected in this lake spread over many miles. It was made in such a way that when the lake was full, the extra water flowed into another lake at a lower level. When that too filled up, the extra water flowed into the next lake. This way all nine lakes filled up. This rain water could be used throughout the year. Today, *Ghadsisar* is no more in use. Many new buildings and colonies have come up in between those nine lakes. Now the water does not get collected in these lakes. Rain water just flows away and is wasted.

Pawan Gupta

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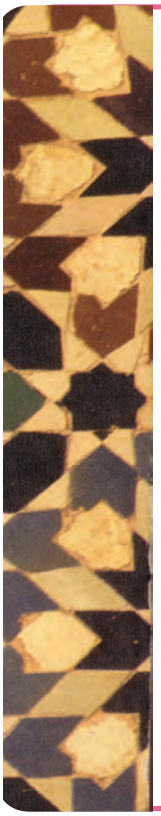

Through the eyes of Al-Biruni

More than a thousand years ago, a traveller came to India. His name was Al-Biruni. The place that he came from is now called Uzbekistan. Al-Biruni carefully observed and noted down the details of all that he saw. He wrote especially about those things that he found very different from his own country. Here is a part of what he wrote about the ponds of that time.

The people here are very skilled at making ponds. My countrymen would be surprised to see them. They pile up huge rocks and join them with iron rods to build *chabutaras* (raised platforms) all around the lake. Between these, there are rows of long staircases, going up and down. The steps for going up and coming down are separate. So there is less crowding.

Today when we study history, we can learn a lot about those days from the writings of Al-Biruni. (This stamp came out in 1973, one thousand years after his birth.)

Observe and find out

- Look at the area around your school. Are there any fields, farms, pucca roads, drains, etc. Is the area sloping, rocky or flat? Think, what will happen here when it rains? Where will the rain water go – into the drains, pipes or pits? Is some water also getting soaked into the soil?

Drop-by-drop

Besides Jaisalmer, many places in Rajasthan, get very little rainfall. Here it rains for only a few days in the entire year, sometimes not even that much. The rivers here do not have

Teacher's Note : We can tell children how Al-Biruni's book is helpful to know about the past. Also discuss about other sources of history, such as old buildings, coins, paintings, etc. Help children to locate Uzbekistan in the world map.

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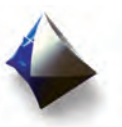
water all round the year. And yet, most of the villages in these areas did not have a shortage of water. People knew that every drop of water was precious. Lakes and *johads* were made to collect water. Water was everyone's need. One and all came together in this work – be it a businessman or a labourer. Some water from the lakes soaked into the ground and reached the wells and *bavdis* (stepwell). The soil of the area also became wet and fertile.

Every house had a system to collect the rain water. Look at the picture on your right. How do you think the rainwater that falls on the roof will reach the underground tank? Draw the path.

Meenu

Have you ever seen a stepwell? Look at the picture. Can you imagine by looking at the picture that the steps go down several storeys deep? Instead of drawing the water up from the well, the people could go down the steps and reach the water. That is why they are called stepwells.

Teacher's Note : How does the earth soak water and how does it reach wells and stepwells? This can be discussed with children.



2024-25

Long ago, people used to make long journeys with their caravans of animals and goods. People felt it was a good thing to give water to thirsty travellers. Thus, they built many beautiful stepwells.

- Have you ever faced a shortage of water in your area? If yes, then what was the reason for it?

  Talk to your grandmother or any elderly person. Find out, when they were of your age:

- From where did they get water for the house? Has there been a change now?
- What kind of water arrangements were made for travellers – for example *piau*, *mashak* (leather bag) or any other? Now what do people do about water when they travel?

Customs related to water

Even today people get water from very old lakes, *dharas*, stepwells and *naulas*. Many customs and festivals are related to water. At some places, whenever lakes get filled up with rainwater, the people gather around the lake to celebrate.

Devraj Agarwal

See the bride of Uttarakhand in this picture. After getting married she has come to the new village. She bows to the spring or the pond. In cities one can see an interesting form of this custom. The new bride worships the tap in her home. Can we even imagine life without water?

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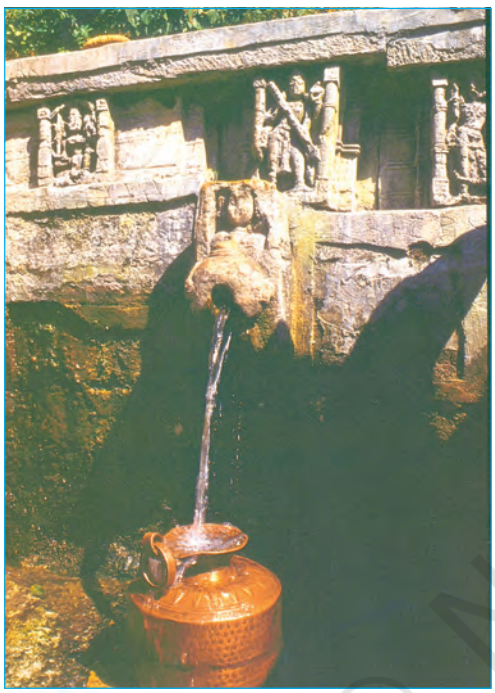
Do you have some special pots for water at your place? Look, water is being filled in this beautiful copper pot. The shining yellow pot of brass is seen in the other picture. Many stone carvings are also made near the place of drinking water. Have you ever seen any beautiful building near the place of water? Where?



Devraj Agarwal

Find out

Is there a lake, well or stepwell near your house or school? Visit it and find out more about it.

- How old is it? Who got it built?
- What kinds of buildings are around it?
- Is the water clean? Is it cleaned regularly?
- Who all use the water?
- Is there any festival celebrated at this place?
- Is there any water today, or is it dry?

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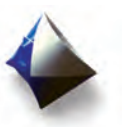

Think over it!

In 1986, there was no rain in Jodhpur and the surrounding areas. People remembered the old and forgotten stepwell (*baoli*). They cleaned the stepwell and more than two hundred trucks of garbage was taken out of it. People of the area collected money. The thirsty town got water from the stepwell. After a few years it rained well and again the stepwell was forgotten.

Discuss

There are two old wells in the area where Punita lives. Her grandmother says that about fifteen - twenty years ago there was water in these wells. The wells could have dried up because:

- Water is being pumped up from under the ground, with the help of electric motors.
- The lakes in which rain water used to collect are no longer there.
- The soil around trees and parks is now covered with cement.
- Is there some other reason for this? Explain.

The story today

Let us see the different ways in which people manage water today.

See page 57 and discuss.

Do you get water in your house by any of these ways? Put a tick (✓) on that. If you get water by some other way, write in your notebook.

Teacher's Note : Discuss the unequal distribution of water with children. It is important to know how people get water from different sources and the problems they face. Though it is challenging, yet it is important to discuss issues of caste and class related to water, especially from the chilldren's perspective.

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This is how we get water

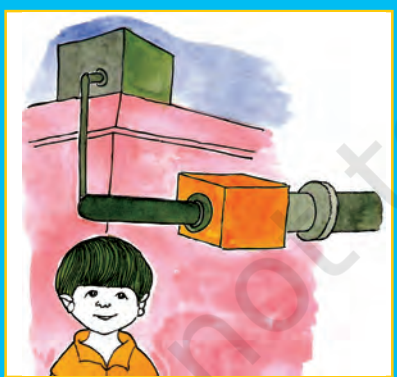
A Jal Board water tanker comes to our colony twice a day. We have to stand in a long queue to get water from the tanker. People at times have fights over water.

We fill water from the well. The nearby well dried up a year ago. Now we have to walk far to reach the other well. We are not allowed to take water from some of the wells because of our caste.

We get water at home for half an hour. We fill this in the tank to use all day. Sometime it is dirty.

We get water from our taps, all day long.

There is a handpump nearby, but the water that we get from it is salty. We have to buy water for drinking.



We have put a pump directly in the Jal Board pipeline. Now we don't have any problem!

We have put a motor to pump up the water from the borewell. But there is no electricity, so what do we do!

We get water from the canal itself.

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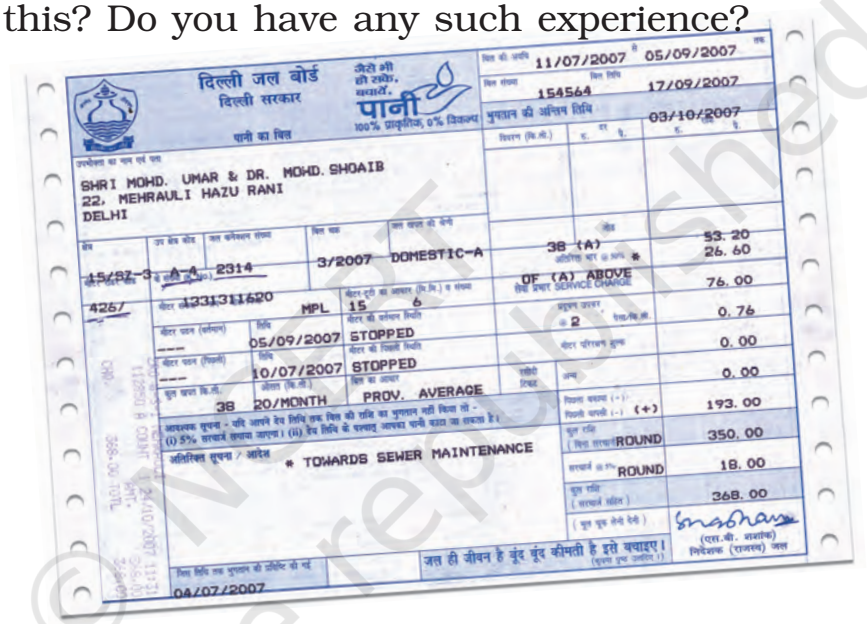
Discuss

- Everyone has the right to live. Yet, is everybody getting enough water to live or even water to drink? Why is it that some people have to buy drinking water? Should it be like this? Water on this earth is for one and all. Some people draw out water from the ground by deep bore wells. How far is it correct? Have you ever seen this? Why do some people put a pump directly in the Jal Board pipe line? What problems would other people face due to this? Do you have any such experience?


दिल्ली जल बोर्ड
दिल्ली सरकार
पानी का बिल
जैसे भी हो सके, बचायें.
पानी
100% प्राकृतिक, 0% विकल्प
11/07/2007 05/09/2007
154564 17/09/2007
03/10/2007
SHRI MOHD. UMAR & DR. MOHD. SHOAIB
22, MEHRAULI HAZU RANI
DELHI
15/SZ-3 A-4 2314 3/2007 DOMESTIC-A
38 (A) 53.20
OF (A) ABOVE 26.60
4267 1331311620 MPL 15 6 76.00
05/09/2007 STOPPED 0.76
10/07/2007 STOPPED 0.00
38 20/MONTH PROV. AVERAGE 0.00
(+) 193.00
ROUND 350.00
ROUND 18.00
368.00
* TOWARDS SEWER MAINTENANCE
04/07/2007
जल ही जीवन है बूंद बूंद कीमती है इसे बचाइए।
(एस.बी. शशांक)
निदेशक (राजस्व) जल

Look at this bill and tell

- From which office has this bill come?
- Do you get a water bill at home? Find out from where it is sent?
- Why do you think Dilli Sarkar (Government of Delhi) is written under Delhi Jal Board?
- In whose name is the bill? How much money do they have to pay for each month?
- Do you have to pay for water? How much? Is the rate of water different in different colonies? Ask your elders.

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It can be done

There are some groups that work hard to bring water to the people of different areas. They ask the elders about the water arrangement in their times. They rebuild the old lakes and *johads*, and also build new ones. Let us see how the group called Tarun Bharat Sangh helped Darki Mai.

This is Darki Mai. She lives in a village in the Alwar district of Rajasthan. The women of the village used to spend the entire day looking after their home and animals. Sometimes, it took them all night to pull water from the well for the animals. In the summer, when the wells dried up, they had to leave the village. Darki Mai heard about this group and asked for help. Together, the people from the group and the village decided to make a lake. The problem of food and water for animals is now less. People get more milk. They have started earning more.

From the book – *Char Gaon ki Katha*

- Have you ever read this kind of news in any newspaper? How did people solve their problem of water? Did they repair and reuse any old lake or stepwell?

What we have learnt

Make a poster : Do you remember the slogan – "Water on earth is for one and all." Think of some other such slogans. Draw pictures and make a nice poster.

Bring a water bill, look at it and tell –

- This bill is from_____date to_____date.
- How much money is to be paid for this bill?
- What else can you see in the bill, like the money spent on repair, maintenance etc.?

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7. Experiments with Water

0529CH07

What floats – what sinks?

Ayesha was waiting for dinner. Today *Ammi* was making her favourite food – *puri* and spicy potatoes.

Ayesha watched as her mother rolled out the *puri* and put it in the hot oil. She saw that at first the *puri* sank to the bottom of the pan. As it puffed up, the *puri* came up and started floating on the oil. One *puri* did not puff up and did not float like the others. On seeing this, Ayesha took some dough and rolled it into a ball. She flattened it and put it in a bowl of water. Alas! it sank to the bottom and stayed there.

Think what would happen if

- Ayesha put a puffed *puri* in a bowl of water. Would it sink or float?
- You put a steel plate on water. Would it sink or float? What would happen to a spoon?
- Would the cap of a plastic bottle sink or float on water?

In the evening Ayesha went for a bath. She had just come out when her mother called, "Ayesha, you have dropped the soap in the water again. Take it out and put it in the soap case." Ayesha was in a hurry and the soap case fell out of

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her hands. It started floating on water. Ayesha gently put the soap in the soap case. She saw that the case continued to float, even with the soap in it.

Have you seen that some thing float on water while others sink? Think how this happens! The poem here raises such questions.

Why, Oh Why?

A wooden boat
in water will float.
But a needle will sink!
Why does this happen?
Let me think...

An iron ship
will also float,
though its' much heavier
than my boat!

But a needle,
light as a leaf,
thin as a pin,
will sink right in!

Why does this happen?
Let me think...

– *Shishir Shobhan Ashthana*
Chakmak, December 1985
(Translated by Anupa Lal)

Do this and find out

Do this experiment in groups of four friends. Each group will need a big pot filled with water and the things listed in the table. Put each thing one-by-one in water and observe. Write your observations in the table given on the next page.

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Mark [✓] for the things that float. Mark [×] for those that sink.

Things to be put in water	I guessed, before I did it	I saw, when I did it
(a) Empty bowl (*katori*) (b) After putting in 6-7 small pebbles, one-by-one		
Iron nail or pin		
Matchstick		
(a) Empty plastic bottle with its lid closed (b) bottle half-filled with water (c) Bottle full of water		
Aluminium foil (from medicine packing) (a) open and spread out (b) pressed tightly into a ball (c) in a cup-like shape		
(a) Soap cake (b) Soap cake on a small plastic plate		
A piece of ice		

Find out from the other groups which things floated and which sank in the water?

After doing the experiment, fill in the blanks.

1. The iron nail _____ in water but the *katori* _____. I think this happened because _____
2. The empty plastic bottle _____ on water. The bottle filled with water _____ because _____
3. The aluminium foil _____ when it was spread out. When pressed tightly into a ball it _____. This may have happened because _____

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Is it magic?

When Ayesha woke up in the morning, *Ammi* had fever. *Abbu* made some tea and went to give medicines to *Ammi*. He told Ayesha, "You boil eggs. Also put some salt in the water." Ayesha took water in a pot. By mistake she put too much salt in the water. She saw the eggs at the bottom of the pot come up a little and start to float in water!

- Take some water in a glass. Put a lemon in it. Now keep putting salt in the water, half-a-spoon at a time. Were you able to float your lemon in water?
- What do you think, the lemon floated in salty water, because.....

Dead Sea

All oceans and seas have salty water. The saltiest of all is the Dead Sea. How salty? Imagine 300 grams of salt in one litre of water! Would you be able to even taste such salty water? It would be very bitter. Interestingly, even if a person does not know how to swim, she would not drown in this sea. She will float in water, as if lying down on it!

Remember the lemon you floated in salty water?

What dissolved, what did not?

On Sunday Ayesha's cousin brother Hamid came to her house to play. As soon as he came he asked his aunt to make his favourite *shakkarpara* (a sweet dish). *Ammi* said, "Let me come back from the market, then I will make some for you. Why don't you help me? Take two glasses of water and put a bowl of sugar in it. Mix it till it dissolves." Hamid thought, "Let me finish this work fast. Then I will watch TV".

- Suggest some ways to Hamid for quickly dissolving sugar.

Teacher's Note : It is not expected that children should be told about density. We should accept different answers that children may give, such as water is 'heavy' or 'thick'.

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Do this experiment

Make groups of four friends. For the experiment you will need 4-5 glasses or bowls, spoons, water, and the things listed in the table. Take some water in each glass. Now try to dissolve one thing in one glass. Observe what happens and note in the table.

Things	Did it dissolve or not?	What happened after keeping for 2 minutes?
1. Salt		
2. Soil		
3. Chalk powder		
4. 1 spoon milk		
5. Oil		

Tell

- Could you see the salt after it dissolved in water? If no, why?
- Does that mean that now the water does not have salt? If it has, then where is the salt?
- What difference did you see – in the water with salt, and the water with chalk powder – after keeping for sometime?
- Which of the two would you be able to separate from the water by straining with a cloth – salt or chalk powder?

Teacher's Note : There are many things which cannot be easily labelled as soluble or insoluble. These categories are anyway not needed here. Children need to be encouraged to fill the table on the basis of their own observations.

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While doing the experiment Ayesha and Hamid had an argument. Ayesha felt that after stirring it, the oil dissolved in water. Hamid did not agree. He said, "Look, the tiny yellow oil drops can still be seen in the water". Ayesha said, "Let's wait for sometime and then see."

- Do you think the oil got dissolved in the water? Why do you think so?

Racing drops

Ayesha put two drops of oil on the lid of her tiffin box. Next to that she put two drops of water and two drops of sugar solution. She tilted the lid. She saw some drops slid down quickly, while some were left behind.

- You also try to do the same and then tell – which drop went ahead? Why did it slide faster?

Where did the water go?

One day Ayesha's mother put some water to boil on the stove for making tea. She got busy with something and forgot about it. When she remembered and came to check, she found very little water left in the pan.

- Think where did the water go?
- Why did Chittibabu and Chinnababu keep their mango jelly in the sun?
- At your house, what things are made by drying in the sun?

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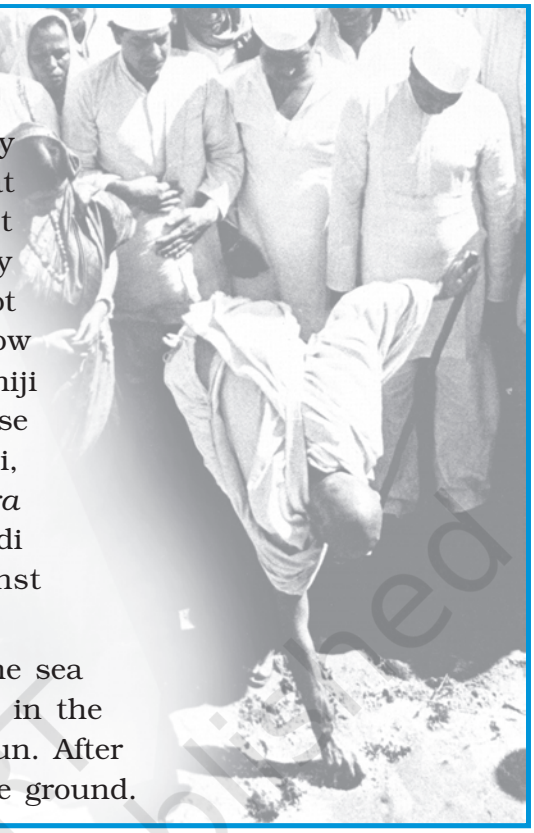
Dandi March



This incident took place in 1930, before India became independent. For many years the British had made a law that did not allow people to make salt themselves. They had also put a heavy tax on salt. By this law people could not make salt even for use at home. "How can anybody live without salt?" Gandhiji said, "How can a law not allow us to use freely what nature has given!" Gandhiji, with several other people, went on a *yatra* (long walk) from Ahmedabad to the Dandi seashore in Gujarat, to protest against this law.

Do you know how salt is made? The sea water is collected in shallow beds dug in the sand. Water is allowed to dry in the sun. After the water dries the salt remains on the ground.

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What we have learnt

- You have washed your handkerchief and you want to dry it quickly. What all can you do?
- What things do you put in water to make tea? Which of those things dissolves in water?
- You have been given some *mishri* pieces (lumps of sugar). Suggest some ways to dissolve them quickly.

Teacher's Note : Children of this age cannot be expected to understand the concept of 'evaporation' but they can begin to think about it. 'Dandi Yatra' can provide a context to talk about the struggle for Independence.

8. A Treat for Mosquitoes

0529CH08

Blood test

Jaskirat

Rajat is back at school today. He had been absent for many days. "How are you now?" asked Aarti. "I'm alright," Rajat replied softy.

Jaskirat: You must have played a lot while you were at home.

Rajat

Rajat : Who wants to play when you have fever! On top of it I had to take a bitter medicine! I even had a blood test.

Jaskirat: A blood test? Why? It must have been very painful.

Rajat: Actually, when the needle pricked my finger, it felt like an ant bite. They took 2-3 drops of blood, and sent it for testing. That's how we came to know that I had malaria.

Nancy

Nancy: But you get malaria when a mosquito bites you.

Rajat: Yes, but we find out by the blood test.

Jaskirat: There are a lot of mosquitoes in my house these days, but I did not get malaria.

Aarti

Nancy: Who says that every mosquito bite causes malaria? Malaria spreads only by the disease carrying mosquitoes.

Aarti: All mosquitoes look the same to me.

Rajat: There must be some difference.

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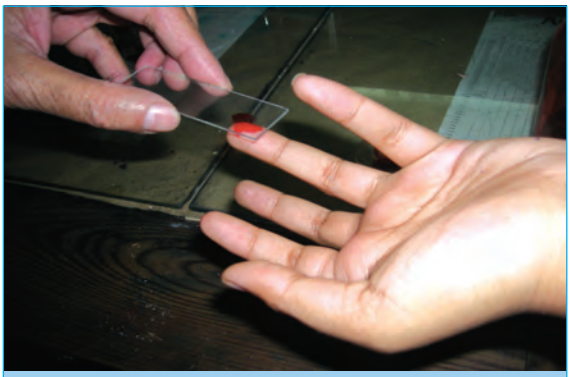


Abid Shamshad

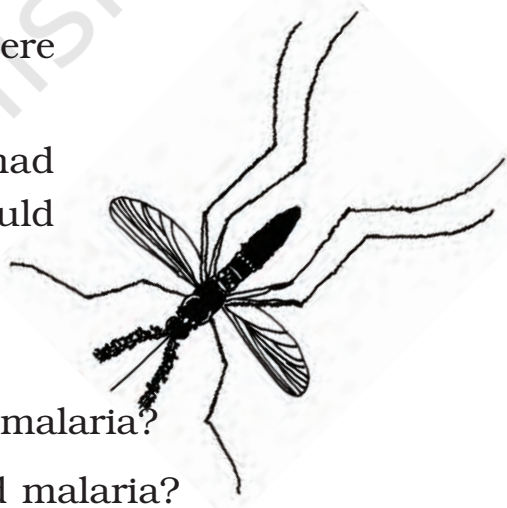
Taking the blood on the glass slide for test Malaria spreads through female mosquitoes (Anopheles)

Dr Maryam looking at the blood slide under the microscope. This microscope makes things look thousand times bigger. The details inside the blood can be seen clearly. There are some microscopes which make things look even more bigger than this one.

Nancy: Did they take the blood from the place where the mosquito had bitten you?

Rajat: Of course not! How do I know when and where the mosquito bit me?

Nancy: But how could they find out that you had malaria by your blood test? Do you think they could see something in the blood?



Find out

- Do you know anyone who has had malaria?
- How did they find out that they had malaria?
- What problems did they have on having malaria?
- What other diseases can be caused by mosquito bites?

- In which season is malaria more common? Why do you think this happens?
- What do you do in your house to protect yourself from mosquitoes? Also find out from your friends about what they do.

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क्लीनिकल विकृति रिपोर्ट
CLINICAL PATHOLOGY REPORT
केंद्रीय सरकार स्वास्थ्य योजना
Central Govt. Health Scheme

18/08/2007

नाम/Name..Rajat.. आयु/Age..11..स्त्री या पुरुष/Sex..Male..

रोग की पहचान/Diagnosis..Fever with Chills and Rigors..
(ठंड लगकर कंपकपी के साथ बुखार)

Malarial Parasite Found in Blood Sample
(खून में मलेरिया के जीवाणु पाए गए)

Pathologist

- Look at the report of the blood test given here. Which words in the report help us to know that the person has malaria?

Medicine for Malaria

From early times, the dried and powdered bark of the *Cinchona* tree was used to make a medicine for malaria. Earlier people used to boil the bark powder and strain the water which was given to patients. Now tablets are made from this.

Anaemia–What's that?

Aarti: You know, I also had to get a blood test done. But they took a syringe full of blood. The blood test showed that I had anaemia.

Rajat: What is that?

Aarti: The doctor said that there is less 'haemoglobin' or iron in the blood. The doctor gave some medicines to give me strength. He also said that I should eat jaggery, *amla* and more green leafy vegetables, because these have iron.

Nancy: How can there be iron in our blood?

Jaskirat: There was something about this in the newspaper yesterday.

Rajat (*laughing*) **:** So then you ate iron or what?!

Aarti: Silly! This is not the iron used to make these keys. I don't know exactly what it was. After I ate a lot of vegetables and whatever the doctor had said, my haemoglobin went up.

Teacher's Note : You can bring a blood report in the class and discuss with the children.

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Anaemia common in Delhi school

17 November, 2007 - Thousands of children studying in the Municipal Corporation schools in Delhi suffer from anaemia. This is affecting both their physical as well as mental health. Due to anaemia, children do not grow well, and their energy levels are low. This also affects their ability to study properly. Now health check ups are being done in the schools and health cards are being made for all the children. Anaemic children are also being given iron tablets.

Tell

क्लीनिकल विकृति रिपोर्ट
CLINICAL PATHOLOGY REPORT
केंद्रीय सरकार स्वास्थ्य योजना
Central Govt. Health Scheme

20/06/2007

नाम/Name..... **Aarti** आयु/Age.....**12**.....स्त्री या पुरुष/Sex..... **Female**

रोग की पहचान/Diagnosis..... **Anaemia (अनीमिया)**

		Normal Range (नॉरमल रेंज)
Haemoglobin (हीमोग्लोबिन)	...8... gm/dl	12 to 16gm/dl

Pathologist

क्लीनिकल विकृति रिपोर्ट
CLINICAL PATHOLOGY REPORT
केंद्रीय सरकार स्वास्थ्य योजना
Central Govt. Health Scheme

15/09/2007

नाम/Name..... **Aarti** आयु/Age.....**12**.....स्त्री या पुरुष/Sex..... **Female**

रोग की पहचान/Diagnosis..... **Anaemia (अनीमिया)**

		Normal Range (नॉरमल रेंज)
Haemoglobin (हीमोग्लोबिन)	...10.5... gm/dl	12 to 16gm/dl

Pathologist

- Look at Aarti's blood report and find out the minimum required haemoglobin?
- How much did Aarti's haemoglobin go up and how long did it take for that?
- What does the newspaper report say about the problems caused by anaemia?
- Have you or anyone in your family ever needed to get a blood test? When and why?

Teacher's Note : A discussion can be initiated in the classroom, about how diseases spread through the housefly. Newspaper reports can also be used in the class.

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- What was found out by the blood test?
- Have you had a health check up in your school? What did the doctor tell you?

Find out

- Ask a doctor or elders about the food items which contain iron.

Baby mosquitoes

Jaskirat: There is a poster on malaria just outside our class.

(*Everyone goes out to look.*)

Are you inviting mosquitoes?

BEWARE!

They Spread Malaria, Dengue, Chikungunya!

- **Don't let water collect around your house. Fill up the pits.**
- **Keep the water pots, coolers and tanks clean. They should be dried every week.**
- **Use mosquito nets to protect yourself.**
- **Spray kerosene if water has collected at some place.**

Rajat: The poster says something about larvae. What are those?

Nancy: They are baby mosquitoes. But they don't look like mosquitoes at all.

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Aarti: Where did you see them?

Nancy: There was an old pot lying behind our house. It was full of water for some days. When I looked there I saw some tiny thread-like grey things swimming. I was surprised when Mummy told me that these had come out of the eggs which mosquitoes lay in water. They are called larvae. I also heard something about this on the radio.

mosquitoes's larvae

Rajat: What did you do?

Nancy: Papa immediately threw away the water. He cleaned and dried the pot and kept it upside down, so that no water would collect.

Jaskirat: Shazia aunty told me that even flies spread diseases, especially stomach problems.

Rajat: But flies don't bite. Then how do they spread diseases?

larvae seen through hand lens

Find out and tell

- Have you seen any poster like this put up anywhere?
- Who do you think puts up such posters, or gives ads in the newspapers?
- What are some of the important points given in the poster?
- Why do you think pictures of a tank, cooler and pits are shown in the poster?

Think

- Why do you think it talks about putting fish in the tank? What do you think the fish eats?
- What will happen when oil is spread on the water?

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Find out

- Which diseases are spread by flies and how?

Mosquito check

Divide your class into two or three groups. Each group will go around to check one area in school or around it. It must carefully note if water has collected anywhere, and mark ✓ where it finds stagnant water.

Pot ☐ Cooler ☐ Tank ☐ Any open space in the school ground ☐ Gutter ☐ Any other place_____

- Since how many days has water collected there?

  _____

- Who is responsible for keeping these places clean?

  _____

- Who is supposed to get the gutters and drains repaired?

  _____

- Can any larvae be seen in the collected water?

  _____

- Has it caused any problem in the area? Write.

  _____

Make a poster

- In your group, make a poster with a message to keep the cooler, tank, drains and the area clean (wherever water collects). Put up your poster in and around your school.
- Find out who is responsible for keeping the area around your school clean. Write a letter from your class, reporting your findings and suggestions. Find out to whom the letter should be written and to which office it should be sent.

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Survey report

Some children did this survey. Here are some of their reports.

Group 1

We found something green around the taps in our school which is called algae. Due to algae (a kind of plant) it had also become slippery there. The algae spreads a lot during the rainy season. We think that they are some kind of small plants that grow in water.

Group 2

There is a pond near the school. At first you cannot see the water in the pond as it is completely covered with plants. One aunty told us that these plants have grown themselves in water. Around the pond there are pits full of water. We also saw some larvae in the water. As we moved around, lots of mosquitoes flew from the plants growing around. Jaskirat feels that there are so many mosquitoes in her house because of this dirty pond nearby.

Tell

Is there a pond or river around your house or school? Go and look around and observe these things:

- Can you see algae in or around the water?
- Where else have you seen algae?
- Are there plants growing on the side or in water? Find out their names. Draw some of these in your note book.
- Do you think these were planted by someone or did they grow on their own?
- What else can you see in water? Make a list.

Ronald Ross

A scientist peeps into a mosquito's stomach

This interesting incident took place almost a hundred years ago. A scientist found out that mosquitoes spread malaria. Let's read about this discovery in his own words.

"My father was a general in the Indian Army. I studied to become a doctor, but what I really liked was reading stories, writing poetry, music and drama. In my free time I enjoyed doing all this.

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In those days, thousands of people used to die from a disease that we now call malaria. The disease was found in areas where there was a lot of rain, or in swampy places. People thought that the illness was caused by some poisonous gas that came from the dirty swampy areas. They gave it the name 'malaria' which means 'bad air'. One doctor had seen tiny germs in the blood of one of the patients, when he observed it under a microscope. But he could not understand how these had got into the patient's blood.

My professor had some ideas about this. "I think that these may be carried by some kind of mosquito." As his student, I spent all my time chasing mosquitoes, to catch and observe. We used to carry empty bottles and chase mosquito after mosquito. Then we would put the mosquitoes into a mosquito net in which there was a patient of malaria. The mosquitoes would have a feast, biting these patients. The patients were paid one *anna* for allowing one mosquitoe to bite them.

I will always remember those days at the hospital in Secundrabad – how we used to cut open the mosquito's stomach and peep into it. I would spend hours and hours bent over the microscope. By night my neck would be stiff and my eyes could not see clearly! It used to be very hot but we dared not fan ourselves, as all the mosquitoes would fly off in the breeze! Once I also fell ill with malaria.

I spent months like this with the microscope, but could not find anything. One day we caught a few mosquitoes that looked different. They were brownish with spotted wings. When I looked into the stomach of one of the female mosquitoes, I saw something black there. I looked closer. I saw that these tiny germs looked just like the ones that were found in the blood of malaria patients. At last we had the proof! Mosquitoes did spread malaria!"

In December 1902, Ronald Ross got the highest award for his discovery—the Nobel Prize for medicine. In 1905, even as he lay dying, Ross's last words were, "I will find something, I will find something new."

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What we have learnt

What can you do so that mosquitoes do not breed in your house, school and neighbourhood?

- How can you find out if someone has malaria?

Teacher's Note : Tell children that '*anna*' was a form of currency used earlier in India. Use the story of Ronald Ross to encourage children to know and talk about scientific processes. It is important to share with children that in an ordinary hospital of Secundarabad many important experiments were done – some successful and some not so successful – which led to an amazing discovery about a disease which has still not been controlled. Collect more such exciting stories on discoveries about different diseases and share with children.

0529CH09

9. Up You Go!

2nd February 1984

Mountaineering Camp

Nehru Institute of Mountaineering, Uttarkashi

We were at the mountaineering camp and were very excited. Twenty of us were teachers from Kendriya Vidyalayas. There were other women from banks and other institutions.

Today was the second day of the camp. In the morning as I got out of bed and put my foot down, I screamed in pain. I remembered yesterday's 26 kilometre walk with the heavy rucksack on my back. I was afraid to go back to that steep climb and the rough narrow path.

With tears in my eyes I started walking slowly towards the room of Brigadier Gyan Singh, the Director of our adventure course. I was thinking of what I would say to excuse myself from that day's trek. Suddenly, I heard his deep voice from behind.

"Madam, what are you doing here at breakfast time? Hurry up! Otherwise you will have to trek on an empty stomach."

"Sir, Sir…..," I could not say any more.

"You have came to tell me that you have blisters on your feet, that you cannot walk, isn't it?"

"Yes, sir."

"That is nothing new. Now get ready quickly."

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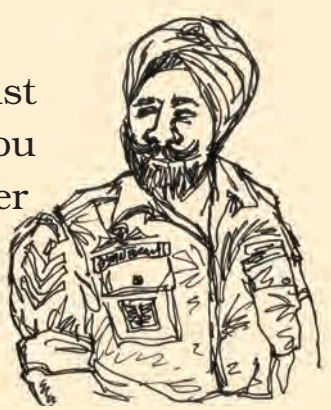
I hung my head and rushed back to get ready. I had just turned when I heard his voice again, "Listen, madam. You will lead group number 7. You will have to help any member who has difficulty climbing the mountain. You have already been told about the responsibilities of a group leader in the mountains."



Tell

- Have you ever seen the mountains? Have you also climbed a mountain? When and where?
- How far have you walked at one time? How far can you walk?

Imagine

- What do you think about the paths on the mountains? Draw a picture.

A big responsibility

I started thinking about what a leader must do:

– Help others in carrying their bags.
– Let the group go ahead and keep to the last.
– Help those who cannot climb properly.
– Find a good place to stop and rest.
– Look after those who are not well.
– Arrange for food for the group.

The most important thing is to be ready to be punished even when some one else may have made a mistake.

I realised that there was a special kind of discipline here. I wondered whether the camp will still be fun!

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Group no. 7

Group No. 7 included girls from Assam, Manipur, Mizoram, Meghalaya and Nagaland. I was the only teacher from Kendriya Vidyalaya in this group. I was happy to meet my new group members. Most of them could not speak Hindi well. I still feel bad that after being together for 21 days, I could not talk even once with Khondonbi from Mizoram. She spoke only Mizo. But in our hearts we grew close to each other.

Tell

- What do you think about the responsibilities of a group leader?
- How would you feel if you were made a leader in such a camp?
- What does a monitor in your class have to do?
- Would you like to be the class monitor? Why?

Crossing the river...

5 February 1984

We got vitamin C, iron tablets and hot chocolate milk with our breakfast. These were given for strength and to keep us warm in the cold. Every morning there would be a medical check up. We tied our bandages and counted the days left!

After an eight kilometre trek we reached a river. There was a thick rope tied across the river, from one bank to the other. The rope was tightly fixed to pegs or 'pitons' on both the sides. I was feeling nervous. I started thinking what would happen if the rope came out. I was trying to estimate how wide the river was.

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Our instructor tied a rope around his waist and put a sling (type of hook) in it. He then put the sling on the thick rope tied across the river. Walking through the icy water, he went to the other side. No one was ready to step into the fast flowing river. Everyone was pushing each other to go first. I stood last in the line hoping that no one would see me. Just then our instructor came near me with the sling and rope in his hands. I knew there was no escape now. I was ready, but did not have the courage. Sir could guess my fears. He called out loudly, "Three cheers for Sangeeta madam!" And before I knew it, someone had gently pushed me into the water.

I felt as if my feet were frozen. I started shivering, my teeth were chattering. I caught hold of the rope and started putting my feet firmly on the river bed. As I walked further in, the river got deeper and slowly the water reached upto my neck. In the middle of the river I lost my balance and started slipping. I was so scared and felt so cold, that the rope slipped from my hands. I started shouting for help.

Kalyani Raghunathan

I was sure I would be carried away by the river. But no, I found that I was tied with the rope to the sling. "Hold the rope! Hold the rope", I could hear the shouts. I somehow managed to get hold of the rope and pull myself forward. Slowly, with some courage, I reached the river bank. I felt a special kind of happiness as I came out of the water. Happiness on finishing a challenging task. Now, standing on the bank, I was calling out to the others to hold the rope tightly. I knew that this confidence was a result of facing a challenge with courage.

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Find out and write

- What kinds of tools are needed for climbing mountains?
- Have you ever seen a hook and rope being used for anything else? Where?
- What else can we use if we want to cross a river in the mountains?
- Why do we need extra energy on the mountains?
- Have you ever heard of anyone who has done something adventurous? What?
- Have you ever done anything adventurous? If yes, tell your class. Write about it in your own words.

Rock climbing

10 February 1984

We had to climb 15 km to reach Tekla village. It was at a height of 1600 metres. Our rucksacks had all that we may need – food packets, water bottle, rope, hook, plastic sheet, diary, torch, towel, soap, windcheater, whistle, glucose, jaggery, *chana* and some other snacks. We could see fruits and vegetables growing in the step fields. We saw Colonel Ram Singh standing on a 90 metres high flat rock with pegs and ropes.

Kalyani Raghunathan

We had been told to first observe the rock carefully and identify holds – places where we can put our hands and feet. Today I was not going to back out. I stood first in the line. Our instructor tied

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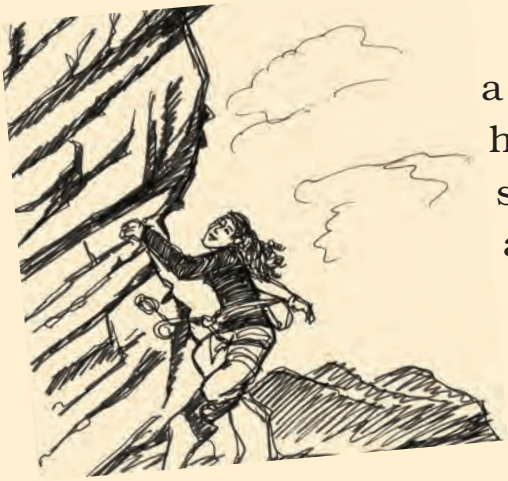

a rope around his waist. He put the sling, and held the thick rope which was hanging. He started climbing as if he was running up. I also put my sling. But as I took my first step, I slipped. And there I was – swinging from the rope!

"Keep your body at an angle of 90° while climbing," I heard. "Keep your back straight. Do not bend."

Keeping this in mind, I imagined the rock as flat ground and started to climb up. Again while coming down we had to use the rope, in a special way called 'rapling.' I did this with the same fearlessness.

Tell

- Have you ever climbed a tree? How did you feel? Were you scared? Did you ever fall?
- Have you ever seen someone climb a small wall? What do you think is the difference between climbing a wall and climbing a high rock?

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A funny incident

14 February 1984

It was evening. Khondonbi was feeling hungry. We did not have anything to eat. She jumped over the fence and got into a field. She quickly plucked two big cucumbers and came back. Just then a woman came from behind and caught hold of her bag. She started saying something to Khondonbi in her own language. We could not understand what she was saying. Khondonbi was trying to explain in her Mizo

language which we could not understand. I tried to explain in Hindi but neither of them could understand it. Finally, I folded my hands to say that we were sorry.

By then our group had gone far ahead. It was already dark. I thought we had lost our way. Now we were really scared. We could not see anything even with our torches. I started sweating even though it was cold. I tightly held Khondonbi's hand. I called out loudly, "Where are you all? Can you hear me?" My voice echoed in the mountains. We both started to whistle loudly and flashed our torches. Probably the group had noticed that we were missing. We heard some whistles at a distance. I understood the signal. We held each other's hand tightly and waited. Khondonbi felt that we should keep talking. She started singing a Mizo song loudly. After some time, we saw them coming towards us. At last! We were with the group again.

Tell

- Is there anyone in your class whose language you do not understand, or who does not understand yours? What do you do in such a case?
- Have you ever lost your way? What did you do then?
- Why do you think Khondonbi would have sung loudly?
- Have you ever seen someone doing something special to get over their fear? What and when?

Try

- Ask your friend for a book without speaking. Try to explain something to the class in the same way.

A special guest

15 February 1984

After dinner we met a special guest – Bachhendri Pal. She had just been

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selected as a part of the team to climb Mount Everest. She had come to seek the blessings of Brigadier Gyan Singh. It was a happy evening – we were all singing. Bachhendri also joined us in singing and dancing on the famous *Pahadi* song '*Bedu Pako, bara masa, kafal pako chaita, meri chhaila.*' At that time we had no idea that Bachhendri would become the first Indian woman to reach Mount Everest and create history.

Camp in the snow

18 February 1984

We were standing at a height of 2134 meters. We were to spend the night here. Everyone was busy trying to put up the tent. We used double layered plastic sheets for the tent and for the ground. The air between the layers would help to keep us warm. We put in the pegs and began to put up the tent. As we tied it from one side, the wind flew the tent from the other side. After quite a lot of pulling and tugging, we managed to get the tent up. Then we dug a drain around the tent.

We were feeling very hungry. We collected some firewood and stones to make a *chulha* and cooked some food. After the meal, we collected all the waste in a bag to clean the camp site. Soon we got into our sleeping bags. I was not sure if I would be able to sleep in it. Would it be comfortable? Would I not feel cold? But the bags were filled with soft feathers, which help in keeping us warm. We were all very tired. So very soon we fell asleep.

Teacher's Note : The children can be encouraged to learn the languages spoken by their friends. This would help them appreciate and respect other languages.

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The next morning we woke up and found that it was snowing. White soft fluffy snowflakes were gently falling. Wow! It was so beautiful! The plants, the trees, the grass and the mountains – everything looked white. Today we were to climb higher, to 2700 metres. We walked carefully on the snow with the help of sticks. It was difficult because we kept slipping. By afternoon we had reached snow covered mountains. We enjoyed throwing snowballs at each other and making a big snowman.

Last day at camp

21 February 1984

We were getting ready for the camp fire. Each group presented a programme. We were enjoying – telling jokes and laughing, singing and dancing around the camp fire. Soon it was midnight. Brigadier Gyan Singh got up and called me. I thought, "Oh, no! what have I done this time?" But when Sir announced my name for the 'Best Performance Award' I stood still. He blessed me and tears of joy rolled down my face.

Discuss

- Why do you think a drain was dug around the tent?
- Besides mountaineering, what are other activities that can be called adventurous? Why?

Kalyani Raghunathan

Teacher's Note : These pages of a diary are based on the real experiences of Sangeeta Arora. She teaches in Kendriya Vidyalaya, Shalimar Bagh, Delhi and is also a member of this EVS textbook writing team.

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Imagine and Write

- You are on a mountain. How do you feel there? What can you see? What do you feel like doing there?

Alone on the mountain top

A twelve-year old girl living in the mountains was out on a school picnic. She climbed a mountain peak of 4000 metres with her friends. The girls had done this for fun and adventure. Soon it was dark and they could not come down. It was also cold and scary. They were alone without any food and it was a long night. This happened to Bachhendri Pal, played when she was a young girl.

Bachhendri grew up in Nakuri village in the Garhwal area of Uttarakhand. When she grew older, she joined Nehru Institute of Mountaineering, Uttarkashi. Her guide was Brigadier Gyan Singh. Bachhendri did very well in her training. She started to train women in mountaineering courses. In 1984, Bachhendri was selected as a team member to climb the Mount Everest.

Snow storm

There were seven women in that 18 member team. On the night of 15th May the team was very tired after having reached a height of 7300 metres. The team put up their tents and went to sleep. Around midnight they heard a loud sound and then a bang. Before they were fully awake, the tent flew off and something very heavy hit them. There was a terrible snow storm. Bachhendri was almost buried under the snow and was hurt on the head. Many of the team members were also injured. The others used snow-picks and axes to dig out those who had been buried under the snow.

The rest of the team members returned to base camp but Bachhendri went ahead, climbing slowly but steadily towards the peak. It was seven minutes past one o'clock in the afternoon of 23th May when Bachhendri Pal stepped onto the peak of 8900 metre high Mount Everest also called Sagarmatha in Nepal.

There was another team member with her. There was no space for two people to stand on the top at the same time. One slip and they would fall straight down-thousands of feet below! Bachhendri and her team-mate dug into the snow and pitched their axe firmly in the ice. Using this as a hook, they tied themselves to it with a rope. Only then two of them could stand there. She was shivering with cold but filled with the warmth of achievement. She bowed her head, pitched the national flag and took photographs. She spent 43 minutes on the highest peak in the world.

Bachhendri Pal became the first Indian woman and the fifth woman in the world to reach the peak of Mount Everest.

Teacher's Note : Teachers can either make available the photographs or if possible the actual mountaineering equipment like sling, pitons, hunter shoes, sleeping bag etc. This will help discussion with children.

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Kalyani Raghunathan

Think

- Why did Bachhendri put up the Indian flag on the peak?
- When have you seen our national flag being hoisted? Collect information of our national flag.
- Make groups of 6-8 children. Design a flag for your group. Explain why you chose that design.
- Have you seen the flag of any other country? Where?

What we have learnt

- Explain why it can be adventerous and challenging to climb a mountain. How would you prepare if you were to climb a mountain? What would you take with you? Write in your own words.

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10. Walls Tell Stories

0529CH10

Reached Golconda

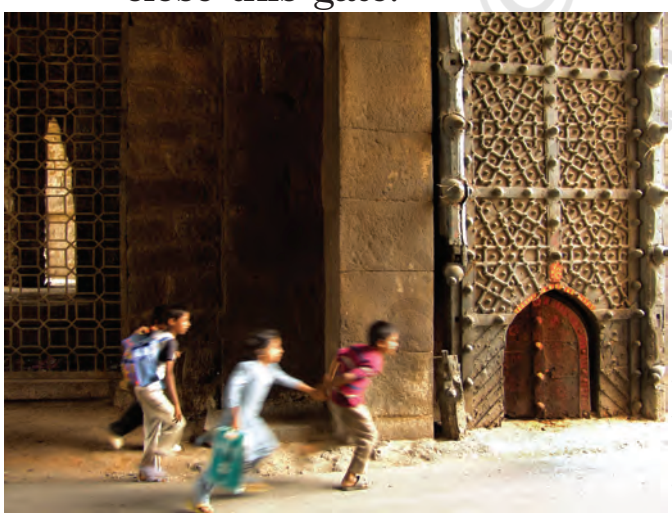
At last we reached Golconda. We were glad that *didi* was with us. *Didi* studies history and we enjoy visiting different places with her.

Shailja: My goodness! This fort is so huge.

Shreedhar: And see at what a height it is built!

Kalyani: Just look! Have you ever seen such a huge gate?

Shailja: It must be very heavy. I wonder how many people would be needed to open and close this gate.



Sukanto Debnath

Why is this small gate made in the big gate?

Kalyani : Look at these sharp iron spokes. I wonder why they were made?

Shailja: Look at these thick walls too.

Shreedhar: I have never seen such thick walls.

Kalyani: At some places, a part of the wall comes out in a round shape. I wonder why?

Didi: These are called bastions (*burj*). See these are even higher than the wall. The outer wall of this fort has 87 bastions. Thick walls, a huge gate and so many bastions! So many ways to ensure security!

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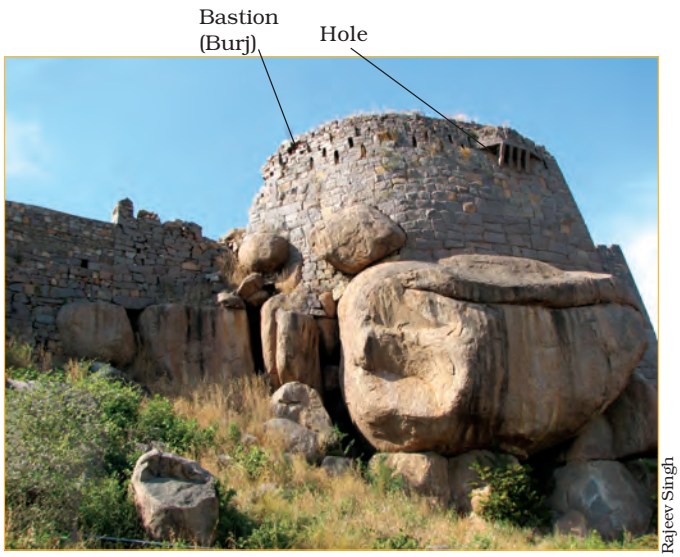

Rajeev Singh

Think

- Why were bastions made in the fort wall?
- Why were big holes made in them?
- What difference would be there if you were to look from a straight flat wall or a bastion at a height? How would the soldiers find peeping from the holes in the bastions useful while attacking?

What did we find inside the fort?

Shailja: I wonder how old this fort would be? Do you think the king built the fort so that he could live here?

Kalyani : It was written outside that Qutubshahi Sultans ruled here one after another, from 1518-1687.

Didi : Much before that, in 1200, this fort was made of mud and different rulers lived here.

Shailja: Oh look! This board has a map of the fort.

Shreedhar: This map shows so many gardens, fields and factories. See, there are many palaces also inside the fort.

Shailja: That means that not only the Sultan, but many other people like farmers and workers must also have been living here.

Kalyani: It must have been a complete town.

The Sultan's Palace

Shreedhar: These steps seem to go on and on.

Teacher's Note : Draw children's attention to how a high and rounded wall can help to see things at a distance and in different directions.

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Shailja: Even in those days they used to have buildings with two floors!

Kalyani: Now, the building is in ruins. But one can imagine that earlier there were many big halls and rooms here.

Shreedhar: Look at this beautiful carving on the walls. It is so fine!

Rajeev Singh

Kalyani : We also saw something like a fountain on one of the roofs.

Didi : Yes, there were many big tanks and fountains here. They used to be full of water.

Rajeev Singh

Wow, what engineering!

Think, even today when engineers design houses, sometimes there is dampness in the walls. And here, so long ago, there were fountains on the terrace! The building must have been made with such good understanding.

If we think how the people lived five hundred years ago, so many questions come to our mind. For example, how was water lifted to such heights? Can you guess how?

Think and discuss

- How would the fountains have worked?
- What arrangements would have been made in the building for air and light?
- Look carefully at the picture of the beautiful carving on the wall. What kind of tools would have been used for such fine carving?
- We still do not have any electricty at many places in our country. Even at places which do have electricity, imagine what would happen if there was no electricity for one week. What are the things that would be difficult to manage without it?

Rajeev Singh

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Where is east-west?

At the place you are, where does the sun rise? Where does it set? Where you are standing, find out what all is there to your east. What all is there to your west? Also find out, what places are to your north and south.

Tell and write

Look carefully at the map of Golconda. On the map, arrows show all the four directions.

(a) If you are peeping inside from Bodli Darwaza, in which direction from you is Katora Hauz?

(b) If someone is entering from Banjara Darwaza, in which direction from her is Katora Hauz?

(c) In which direction will you walk from Bala Hisar to reach Moti Mahal?

(d) How many gates can you see on the outer walls of the fort?

(e) Count how many palaces are there in the fort?

(f) What arrangements for water can you see inside the fort? For example, wells, tanks, stepwells.

On the map, 1 cm distance is equal to a distance of 110 metres on the ground. Now tell

- On the map the distance between Bala Hisar and Fateh Darwaja is ____ cm. On the ground, the distance between the two would be ____ metres.
- How far is Makai Darwaza from Fateh Darwaza?

Teacher's Note: Children take a lot of time in identifying directions. They are often confused about the north and south directions. Many a times we adults also think that north is upwards. We also often show the 'north' direction by pointing to the top of the paper. Question (a) and (b) may be answered by the students in terms of front, back, left and right. It is not expected that children will be able to understand directions by doing the activity once. It is important to link children's own experiences with this.

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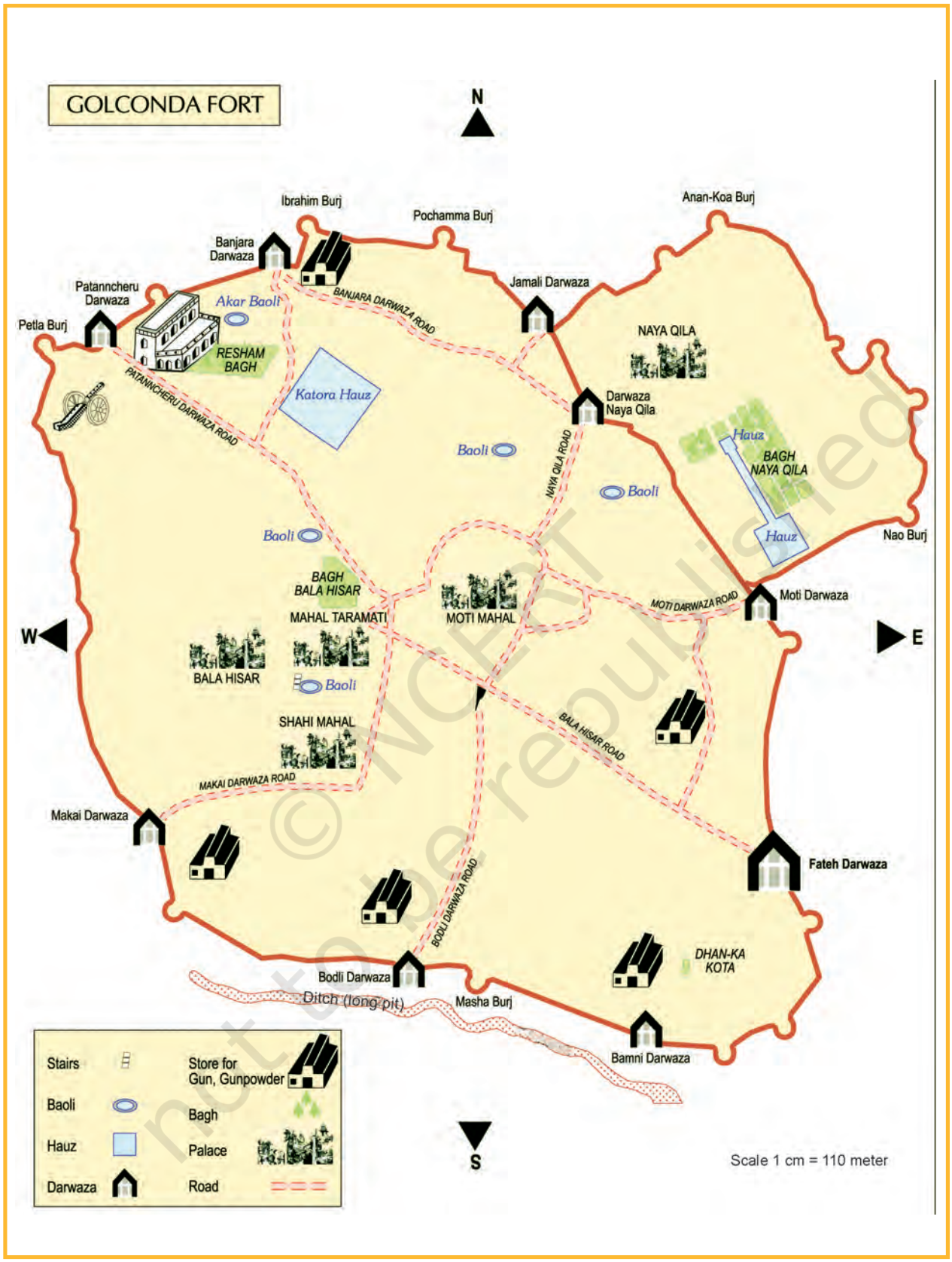

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Rajeev Singh

Why these attacks?

While we were all talking, Shreedhar called us to see a big gun (cannon). We ran up the steps.

Shailja: This must have been the Sultan's big gun.

Didi **:** This was used by Aurangzeb. His full army came with their guns and cannons to attack but they could not even enter the fort. For eight months they camped outside the fort.

Shailja: Why would the army come here all the way from Delhi?

Didi**:** In those days, emperors and kings, played such tricks. They tried to make smaller kingdoms a part of their own kingdom. This was done sometimes by friendship, sometimes by flattery, or even by marriage between families. And when nothing else worked, they also attacked them!

Kalyani: Why is it that Aurangzeb's army could not get into the fort? He had so many soldiers and big guns.

Shailja: Didn't you see these strong thick walls? In the map there is a long deep ditch (pit) along the wall. How could the army enter?

Shreedhar: If the army tried to come from a different side, then the soldiers in the bastions would have seen it from a distance. No wonder it was difficult to attack the fort!

Kalyani: Imagine! The army is coming on horses and elephants, with all their guns. Here, the Sultan's army stands fully prepared.

Shailja: Oh no! How many people and soldiers on both the sides must have been killed in all this fighting? Why do people attack and have wars?

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Shreedhar: Guns and cannons are things of the past now. These days many countries have nuclear bombs. A single bomb can cause so much destruction!

Discuss

- Have you recently read or heard about any country attacking or going to war with another country?
- Find out what was the reason for this war.
- What kind of weapons were used in this war?
- What kind of destruction was caused because of this?

Find out

The big gun that Shreedhar saw was made of bronze.

- Have you seen anything made of bronze? What?

  Tribal people have been using bronze to make many things since thousands of years. One wonders how they took out copper and tin from the deep mines, melted these metals, and turned them into beautiful things!

- Find out from your elders about some of the things made from bronze that were, or are still used in your house. From its colour try to identify which one of them is made from copper, which from brass, and which from bronze.

When there was no telephone

Didi asked us to wait at the king's palace. She herself went to Fateh Darwaza. A while later we heard Didi's voice, "Alert! I am Sultan Abul Hassan. I am very fond of music and Kuchipudi dance." We all laughed. We were surprised how didi's voice could be heard from so far. She later told us that if you stand at Fateh Darwaza whatever you speak can be heard at the king's palace.

Teacher's Note: Pictures of bronze and brass vessels have also been given in Chapter 6. Encourage children to identify different metals from their colours.

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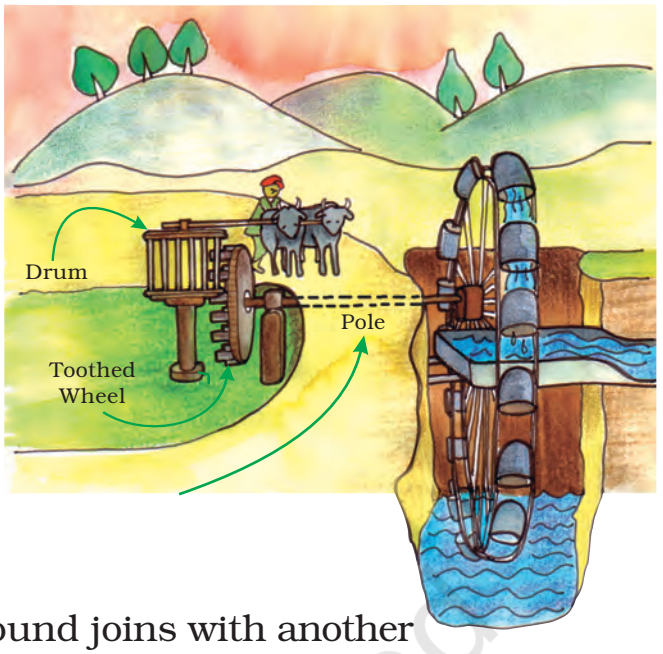
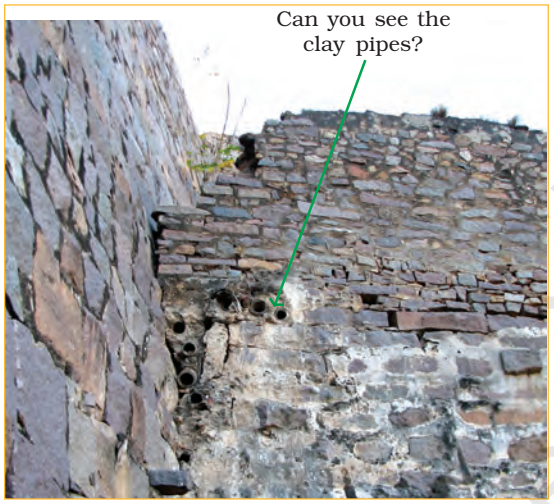
Arrangements for water

The picture shown here is made after seeing a very old painting of those times. Can you think why bullocks have been used here? Use your hand movement to show in which direction the drum attached to the rod moves when the bullocks move. In which direction would the 'toothed wheel' move?



Look, this pole shown under the ground joins with another wheel which has a number of pots on it.



Rajeev Singh

- Now imagine, how would this garland of pots lift water from the well?
- Do you now get some idea about how the tanks could have been filled by lifting water from the wells? Even today we can see clay pipes in the walls of the fort. These pipes would have been used to carry water to different places in the palace.

- Where else have you seen such wheels attached to each other. For example, in the gear of a cycle or somewhere else?
- Look around and find out how water is pumped up from the ground to higher places?
- How is water pumped up using electricity? How is water lifted without electricity?

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What a sad sight!

Talking, whistling and listening to our own echo we were walking through this *mehrab* (arch).

Rajeev Singh

Shreedhar: Oh! The breeze feels so cool in this tunnel.

Shailja: It was written that soldiers stayed here.

Shreedhar: See this board, but look what the wall is like!

Shailja: Oh! Think how this wall has seen thousands of years go by. It has seen kings and queens, horses and elephants, war and peace... But we have spoilt it in just a few years!

Kalyani: I don't understand, what kind of fun do people get in writing their names all over the place like this?

Close your eyes and go back in time!

Imagine that you are in those days when there was a busy town inside Golconda. Think about the questions given below and discuss in class. You could even put up a play.

- What is the Sultan doing in the palace? What kind of clothes is he wearing? What dishes are being offered to him? But why does he seem so worried? And in what language is he talking?

Teacher's Note: Through this activity encourage children to imagine how life would have been at that time – the food habits, clothes, etc. They can express these in a variety of ways, like by acting, drawing, making a story, etc.

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- Imagine the rooms in the palace—the beautiful carpets and curtains, the fountains on the terrace... and the sweet smell of roses and *chameli*—where is this coming from?
- What are the different kinds of factories you can see? How many people are working there? What are they doing? What are they wearing? How long do you think they work?
- Look there! See how finely those craftsmen are carving the stones using a chisel and hammer? Can you see the stone dust in the air. Do you think this stone dust would harm them in some way?

Rajiv Singh

Going to the museum

After seeing Golconda, the children also went to a museum in Hyderabad. Many old items are kept there. Many things were found when the place around Golconda was dug – like pots, jewellery, swords, etc.

Shailja: Oh! Why are these broken pieces of pots kept in the almirah? See that small plate made of bronze. That blue piece seems to be made of ceramic (clay).

Didi : It is through all these things that we come to know how people of those times lived, what they used and what things they made. If all these would not have been kept here, how would you know so much about those times?

Teacher's Note: Encourage children to talk to their elders and neighbours about old times. This would help develop their understanding of history.

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Write

- What kinds of pots have you seen around you?
- Try to find out from your grandparents about the other kinds of pots and pans they used in their time?
- Have you ever been to some museum or heard about it? What all things are there in a museum?

Survey and write

- Is there any old building or monument near your house which people come to see? If yes, name it.
- Have you ever gone to see an old monument? Which was that? Did you feel it told you a story? What could you know about those times from it?
- How old was it? How did you know? _____
- What was it made of? _____
- What colour was it? _____
- Were there any special kind of designs on the old building? Draw them in your notebook.

_____

- Who used to live there in the olden days? _____
- What kinds of activities took place there? _____
- Do some people still live there? _____

Teacher's Note: Talk to children about various sources of history, such as maps, pictures, excavated things, books, records and ledgers.

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Make your own museum

Rajni teaches in a Government school in Mallapuram district in Kerala. Together with the children of her class, she has collected many old things from all the houses. Like old walking sticks, locks, umbrellas, wooden slippers (*khadaun*), pots, etc. They also saw what these things look like today. Rajni and the children put up an exhibition, which people from the neighbourhood came to see. You could also do this.

Look at the painting and tell

This painting is 500 years old. It shows Agra fort being constructed.

What kinds of work are people doing? How many men and women are working? See, how they are taking the huge pillar up along the slope? Is it easier to lift a heavy thing straight up or along a slope? Were you able to see the man carrying water in a *mashak* (leather bag)?

What we have learnt

- Sangeeta thinks it is useless to keep old things in a museum. How would you convince her that it is important to have a museum?
- Why do you think the chapter is named, 'Walls Tell Stories'?

2024-25

11. Sunita in Space

0529CH11

Straight from the heart

What do you think the earth looks like? Make a drawing of the earth in your notebook. On your drawing show where you are. Take a look at your friends' drawings too.

What is our earth really like?

Uzaira and Shahmir are playing with the globe. While they play they are talking to each other.

Uzaira: Do you know that Sunita Williams is visiting our school tomorrow? I have heard that she has spent more than six months in space.

Shahmir: (*looking at the globe*) Hmm... look here is America, Africa. Hey, where is space?

Uzaira: The sky, stars, sun and moon, they are all in space.

Shahmir: Yes, I know. Sunita Williams went in a spaceship. I saw on TV that she could see the earth from there.

Uzaira: Yes, from there the earth looked like this globe.

Shahmir: If our earth looks like this globe, then where are we?

(*Uzaira takes a pen and places it on the globe.*)

Uzaira : Here we are. This is India.

Shahmir: If we were here like this, we would all fall off. I think we must be inside the globe.

Teacher's Note : We know that scientists have also struggled to build an understanding of the shape of the earth. It is difficult for young children to understand the shape of the earth. Encourage children to express their ideas freely.

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Uzaira: If we are inside, then where is the sky, the sun, the moon and the stars? We must be on the globe. And all the seas and oceans must also be on the globe.

Shahmir: (*pointing towards the lower part of the globe*) You mean to say that no one stays here?

Uzaira: People live here too. Brazil and Argentina are here.

Shahmir: Are the people there standing upside down? Why don't these people fall off?

Uzaira: Yes, it looks strange, isn't it? And this blue part must be the sea. Why doesn't the sea water fall off?

What do you think?

- If the earth is round like a globe, how is it that we do not fall off?
- Do the people in Argentina stand upside down?

Talking with Sunita

When Sunita Williams came to India, thousands of children like Uzaira and Shahmir got a chance to meet her. Sunita says

Teacher's Note : Children can be told about Kalpana Chawla and her space travel. An interesting book for teachers is – *How We Found the Earth is Round* by Isaac Asimov (Longman). This book talks about the way people in different cultures have been thinking about the concept of earth over centuries. Interestingly, even today children's ideas match many of those ideas and thoughts. Even for adults it can be mind boggling to imagine that people in Argentina and India are actually standing upside down in relation to each other. There is actually no 'up' and 'down' on the earth, it is relative.

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that her friend Kalpana Chawla wanted to come to India and meet children. She came to India to fulfil Kalpana's dream.

Sunita's experiences of living in space!

- We could not sit at one place. We kept floating in the spaceship from one end to another.
- Water too doesn't stay at one place. It floats around as blobs. To wash our face or hands we had to catch these blobs and wet paper with them.

NASA

- We ate very differently there. The real fun was when all of us would float into the dining area of the spaceship and catch the floating food packets!
- In space there was no need to use a comb. My hair kept standing all the time!
- Not being able to walk, we had to get used to floating around. We had to learn to do simple things differently. To stay at one place, we had to strap ourselves there. Papers also had to be stuck to the wall of the spaceship. It was a lot of fun living in space but it was also difficult.

Look at the photographs and write

- Can you think why Sunita's hair was standing?
- Look at Sunita's photographs and the dates written on each of them. Write what all is happening and when?

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We take off (9-12-2006)

Our feet don't stay on the floor! (11-12-2006)

Look, my hair is standing, no problem while working (13-12-06)

Where is this food flying away? (11-12-2006)

Sunita outside the spaceship, really in space! (16-12-06)

Courtesy : NASA

Classroom becomes a spaceship

- Close your eyes. Imagine that your class is a spaceship. Zooo...m – in 10 minutes you have entered in space. Your spaceship is now going around the earth. Now say:
  - Are you able to sit at one place?
  - What about your hair?
  - Oh, look ... where are your bags and books going?
  - And what is your teacher doing? Where is her chalk?
  - How did you eat your food during the break? How did you drink water? What happened to the ball that you threw up?
- Act out or draw the scene.

Isn't it amazing?

On the earth when we throw something up, it comes down. When we throw a ball up in air, it falls back. We are able to catch it. On the earth, we don't keep floating around. When we fill a glass or bucket with water, it stays there. It doesn't float around in blobs as Sunita Williams says. It is something special about the earth that makes this happen! The earth pulls everything towards itself.

Sunita Williams went 360 kilometres away from the earth, in the spaceship. Think how far this would be! Find out which town or city is located about 360 kilometres away from where you live. This is how far Sunita Williams went away from the earth.

- Can you now say why Sunita's hair kept standing?
- Think why water flows downwards on any slope. On mountains too water flows downwards, not upwards.

Teacher's Note : It is challenging even for adults to understand how things behave in space. The photographs given can be used to initiate discussion. It is important to help children to raise questions and imagine things in space. We become so used to things being pulled by the earth's gravity that we never give it much thought. It becomes tough for us to imagine what would happen if there was no gravitational pull.

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Magic 1 – A tiny paper races a coin

Take a 5 rupee coin and a small piece of paper. The paper should be about one-fourth the size of the coin.

1. Hold the coin in one hand and the paper in the other. Drop them at the same time. What happened?
2. Now place the tiny paper on the coin and drop them. What happened this time? Surprised!

1

2

Magic 2 – A mouse lifts an elephant!

To play this you will need a small stone, a bigger stone (lemon-sized), a thick roll of paper (which can be made with layers of papers), mouse and an elephant made of paper.

- Take a string about 2 feet long.
- At one end of the string tie the small stone. Stick or tie the mouse to the stone.
- Put the string into the roll of paper.
- At the other end of the string tie the bigger stone and stick the elephant.
- Hold the roll of paper and move your hand to rotate the small stone.

Who is pulling whom? You will be surprised! The mouse lifts the elephant! How did this magic happen?

Where are the lines, really!

Sunita describes her view of the earth from the spaceship: "The earth looks so beautiful and amazing. We could watch it for hours, from the window of the spaceship. We could clearly see the curved shape of the earth."

Teacher's Note : Sunita's experiences have been used to give to children a sense of the earth's gravity. Use of the term 'gravity' is not needed here. Children would need to be helped to construct an understanding about the pull of the earth. This can be done only by linking it with children's own experiences.

It seems magical when the tiny paper falls with the coin at the same time. This is because in our daily life we find that the air slows down the speed of leaves or paper while they fall. Children are not expected to understand the science behind the magic - 'A mouse lifts an elephant!' They might not even be able to understand that the bigger stone is lifted against the earth's gravitation. Actually, in the spaceship Sunita did not experience the pull of the earth because the spaceship was revolving around the earth.

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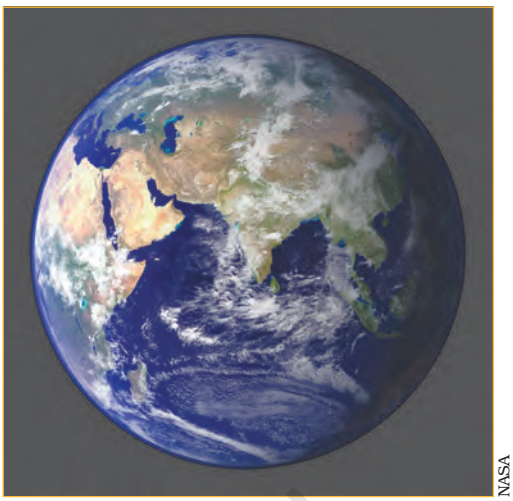
Look at this photograph of the earth, taken from a spaceship. From such photographs today we know what the earth looks like. But thousands of years ago, people could only imagine what the earth looked like. Scientists tried hard to find out – how big is the earth, how does it go around?



NASA

Look at this photograph and tell

- Can you see India?
- Can you recognise any other place?
- Where is the sea?
- Do you find anything similar between the globe and this picture of the earth? In what ways are they different?
- Do you think Sunita could make out Pakistan, Nepal and Burma separately, when she saw the earth from space?

Look at a globe in your school and tell

- Can you find India?
- Where all do you find the sea?
- Which countries can you see?
- Can you see some of the countries with which India plays cricket matches? For example: England, Australia, Pakistan, Bangladesh and South Africa.
- What else can you see on the globe?

(*Uzaira and Shahmir are looking at different countries on the globe.*)

Uzaira: See, there are lines between the different countries on this globe. Are such lines also there on the earth?

Shahmir: There must be. They are there on the map of India in this book. See, there are lines between the different states too.

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Uzaira: If we go from Delhi to Rajasthan, would we find such lines made on the ground?

Look at the map of your country and tell

- Can you find the state in which you live? Write its name on the map.
- Which are the states next to the state you live in?
- Have you been to any other state?
- Shahmir thinks that there are lines drawn on the ground between the states. What do you think?

When Sunita saw the earth from space she found the earth very beautiful. Many thoughts came to her mind. As she describes it, "From so far away, one can only make out the land and the sea. One cannot see the different countries. Division into countries has been done by us. All the lines on the maps are made by us, they are in our minds. I wish we all think about this. Where are the lines, really?"

Look at the Sky

Shahmir: (*He closes one eye and moves the coin back and forth while looking at the moon.*) Look, I can hide the moon behind this coin.

Uzaira: Wow! Imagine hiding such a big moon behind such a small coin.

- Why don't you try to do the same with a coin? How many centimetres away from the eye did you keep the coin to hide the moon?

Think

- Do you think the moon is flat like the coin or round like a ball?

Have you ever looked carefully at the sky at night? Don't the twinkling stars look magical! And sometimes the moon is silvery and bright, while sometimes it is nowhere to be seen in the black sky.

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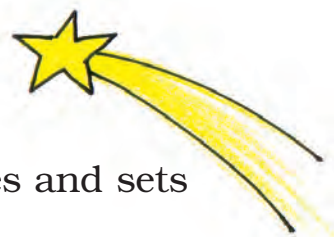
- Look at the moon tonight and draw what it looks like. Look and draw again after one week, and then after 15 days.

Today's Date	Date after a week	Date after 15 days

Find out

- When is the next full moon? At what time will the moon rise on this day? What does the moon look like on this day? Draw it.
- What are the festivals related to the moon?
- At night look at the sky carefully for 5 minutes.
  - What could you see?
  - Did you see anything moving in the sky? What do you think it could be? A star or a shooting star or a satellite (satellites are used for the TV, telephones and for weather reports). Find out more about this.



Look at the table and tell

Given below are the times at which the moon rises and sets in Delhi (on the given days).

Date	Time of moon rise (hours : minutes)	Time of moon set (hours : minutes)
28-10-2007	19:16	08:50
29-10-2007	20:17	10:03
30-10-2007	21:22	11:08
31-10-2007	22:29	12:03

- On 28 October the moon came out at ___ minutes past ___ o'clock.
- On 29 October the moon came out at ___ minutes past ___ o'clock.

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- On 29 October there was a difference of ___ hours and ___ minutes in the time of the moon rise (as compared to 28 October).
- If you saw the moon rising at 7 pm today, would you see it at the same time tomorrow?
- On 31 October the time of setting of the moon is given as 12:03. Have you ever seen the moon at 12 in the afternoon? Why don't we easily see the moon or stars during the day?

The poet is also raising such questions in this poem.

Twinkling stars

Stars are twinkling
in the sky.
Why do they twinkle?
Tell me why.
How many can you see?

Some seem near
and some seem far.
Is there a name
for every star?
How many can you see?

They shine so bright
in the dark of night!
Why do they hide
in the morning light?
How many can you see?

Some shining stars
we know so well.
But every star
has a tale to tell!
How many can you see?

– Anware Islam
Chakmak, December 2003
(Translated by Anupa Lal)

NASA

An interesting photograph!

A spaceship went to the moon. This photograph of the earth was clicked from the surface of the moon.

See how the earth is looking. Can you see the surface of the moon? Do you have some questions after looking at this picture? Write down those questions and discuss them in the class.

Teacher's Note : Both children and adults enjoy looking at and admiring the night sky. Children will need help understanding the difference between a star, a shooting star and a satellite. Stars can be seen twinkling. A shining object which seems to move with a constant speed in the sky can be a satellite. A shooting star is actually a meteroite which catches fire when it enters the earth's atmosphere. When we show interest ourselves children will also be motivated to observe the night sky and learn many new things.

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Do your best and things will work out!

When Sunita was five years old she saw pictures of Neil Armstrong landing on the moon. In 1969, Neil Armstrong was the first man to walk on the moon. Like any other child, Sunita was also fascinated. Sunita says that when she was a young girl she really loved sports and swimming. She was never too interested in studies. After high school Sunita wanted to become a diver. But she could not get into that course. Instead, she became a helicopter pilot. One day she found out that if she studied and trained for it, she could join the Space Mission. And that is what she did! In 2007 Sunita Williams set a new record for the longest space flight by a woman.

Sunita often gives her own example to tell children, "If you want something, but you get something else, do not give up. Do your best, and things will work out!"

When Sunita was asked by a child what would she like to do in the future, she answered, "I want to become a school teacher!" So that she could make children understand how science and maths are closely linked to our lives.

What we have learnt

- Why do children always slide down the slide and not slide up? If this slide were there in Sunita's spacecraft, would children slide like this? Why?
- Why do we see stars mostly at night?
- Looking at earth from the space, Sunita said, "Different countries cannot be seen as separate from here. These lines are on paper. They are made by us." What do you understand by this?

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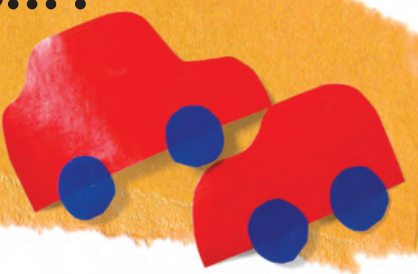
12. What if it Finishes...?

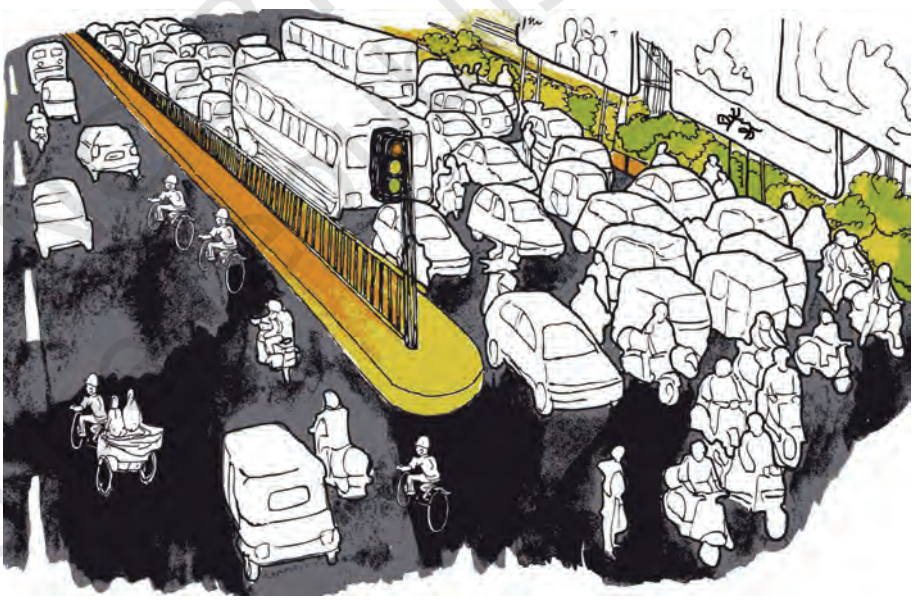


0529CH12

A bus journey

Today, we were going on a school trip to the Adalaj stepwell (*baoli*), about eighteen kilometres from Ahmedabad. We began counting the vehicles on the road. Some of us counted the bicycles, others counted the buses, cars, and motorcycles. Abraham, who was counting bicycles, soon got bored. There were hardly any bicycles on this highway.

Screeeech! The driver suddenly braked at the red light. It was a big crossing, and we could see the traffic lined up on all sides. Honk, honk, the sound of loud horns, and smoke coming out of the vehicles! May be that is why a little boy in a rickshaw was coughing so much. I smelt something, familiar. I remembered this smell – it came from Baba's tractor in the village.



Teacher's Note : Examples of familiar highways can help children see the difference between various kinds of roads. Discussion with children could involve listening to their own experiences about the noise made by vehicles and the ill effects of smoke. Discuss road safety rules in the class.

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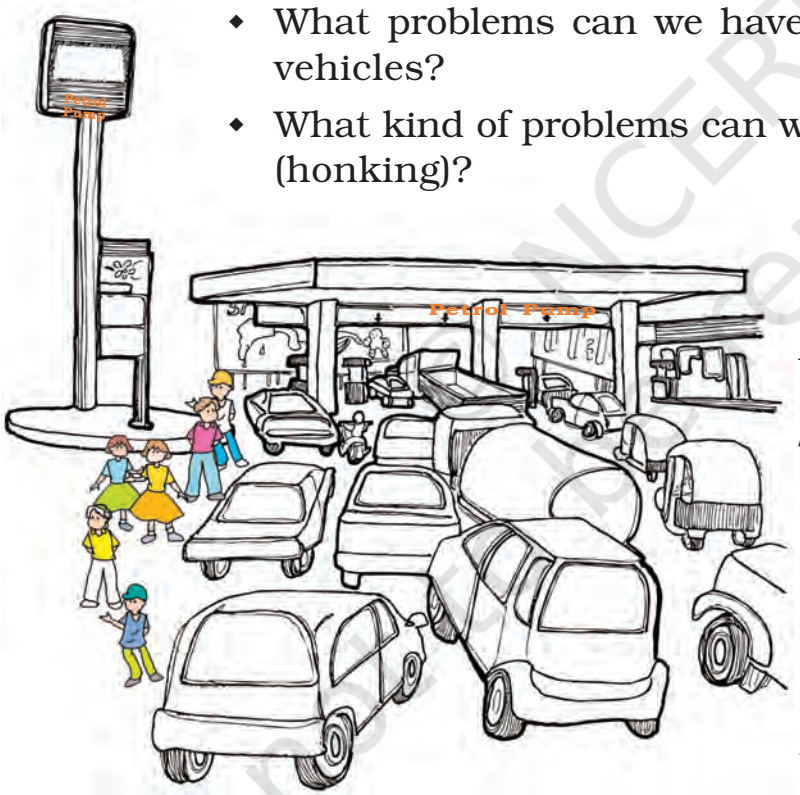
Look at the picture on page 110 and write

- What are the different kinds of vehicles that you can see?
- What do you think they need petrol and diesel as fuel?
- Which of the vehicles do you think give off smoke? Put a red mark on those.
- Which are the vehicles run without petrol and diesel?
- What problems do we face from the speeding vehicles?

Tell

- Do you ride a bicycle? If yes, where all do you go on it?
- How do you come to school?
- How do your family members go to work from home?
- What problems can we have from smoke coming out of vehicles?
- What kind of problems can we face from noise of vehicles (honking)?



On the petrol pump

After sometime our bus stopped at a petrol pump. There was a long queue. It seemed as if we would have a long wait. We all got down from the bus and started looking around the petrol pump. We saw many large boards and posters.

Teacher's Note : The term 'oil' can be used for petrol, diesel and crude oil. Discuss with children about various minerals which are mined from deep inside the earth.

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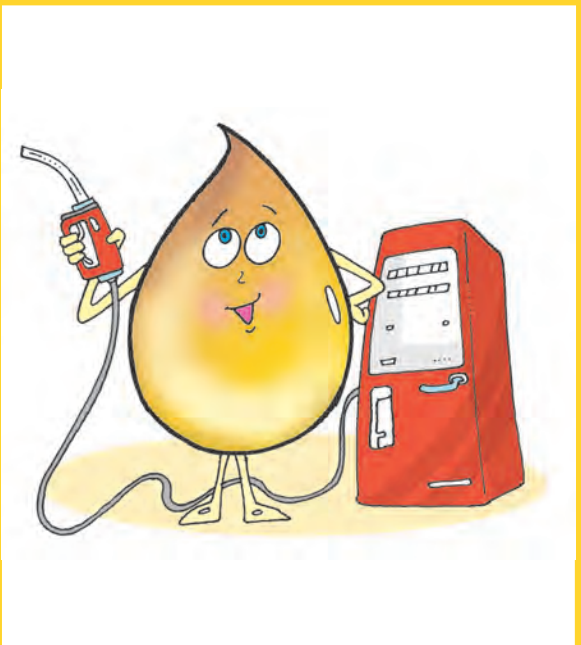

- **Petrol and diesel will not last forever. Save it for your children.**
- **Make every drop go a long way.**
- **Switch off the engine when you stop the car.**

Date 02-08-2021
Rate

Petrol:	₹ 98.59 per litre
Diesel:	₹ 96.90 per litre

We could not understand why it was written that petrol and diesel will not last forever. We thought of asking an uncle who works at the petrol pump.

Abraham : Uncle, from where do we get petrol and diesel?

Uncle (*who works at the petrol pump*) : From deep, deep down under the ground.

Manju : But how does it get made there?

Uncle: It is formed naturally, but very slowly. It is not made by a human being or a machine.

Abraham : Then we don't need to buy it. We can take it out ourselves using a borewell, like we pump out water!

Uncle : It is not found everywhere, but only at a few places in our country. We need big machines to pump it out and clean it.

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Find out and discuss

- Which states of India have oil fields?
- Besides oil, what else is found deep inside the earth?
- Find out the traffic rules and discuss them in the class.
- We should use petrol and diesel judiciously. Think why?

They discuss further...

Divya : Is petrol going to finish? The poster said that petrol is not going to last forever.

Uncle : It does not get made as fast as we take it out. It takes lakhs of years for it to be formed under the earth.

Abraham : How will vehicles run if the oil finishes?

Manju : On CNG. I had seen on TV that vehicles which run on CNG give less smoke.

Uncle (*laughing*) **:** That too comes from below the earth. It is also limited.

Divya : Electricity can be used to run vehicles. I have seen an electric bicycle.

Abraham : We will have to do something. Or else, how will we travel when we grow up?

Divya : My *dadi* (grandmother) would be happy, if fewer vehicles run on the road. She says, "Look! vehicles line up like ants. What will you do when you grow up?"

Manju : See, only one or two people are sitting in these cars. Why doesn't everyone use a bus?

Abraham : That will save petrol. One bus can carry many people.

Manju : When I grow up I will invent a car that runs on sunlight. Then we won't have to worry about it getting finished. We can use it as much as we want!

Teacher's Note : Different uses of solar energy can be discussed. The concept of 'energy' is abstract for children of this age but they can begin thinking of it in terms of strength, power, etc. Encourage children to think which resources are limited and why. Discuss in the class.

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Treasure from the earth

It is not easy to find out where oil is, deep down below the earth. Scientists use special techniques and machines to find this out. Then through pipes and machines petroleum is pumped up. This oil is a smelly, thick, dark coloured liquid. It contains many things mixed in it. To clean and separate these, it is sent to a refinery. Have you heard of a 'refinery'?

It is from this 'petroleum' or oil that we get kerosene, diesel, petrol, engine oil and fuel for aircrafts. Do you know that L.P.G. (cooking gas), wax, coaltar and grease are also obtained from this?

It is also used in making several other things like plastics and paints.

I started thinking about saving oil. I remembered that sometimes Baba keeps the engine of the tractor on, while doing something else. At times, the pump in the field is also left on. How much oil would be going waste! I thought I will surely talk to Baba when I get home.

Write

- What all can vehicles run on?
- What kinds of problems will we face, if the number of vehicles keep on increasing? For example, more traffic on the road. Talk to your elders and write about it.
- Manju said, "Why doesn't everyone use a bus?" What do you think, why don't people travel by buses?
- Suggest some ways to deal with the problems arising out of the growing number of vehicles.
- What are the benefits, if we switch off the engine of the vehicles at the red light on the road?

Teacher's Note : Discuss about the possible options for reducing the number of vehicles on the road and also use different news reports related to it.

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Find out and write

How much oil?	Scooter	Car	Tractor
How much petrol/diesel can be filled at a time?			
How far can it go on one litre of petrol/diesel?			

The rates of petrol are different in each city. The rates of petrol and diesel in Delhi are given here. Look at the table and answer the questions.

Oil	Rate of one litre in 2002 (Oct)	Rate of one litre in 2007 (Oct)	Rate of one litre in 2014 (Oct)	Rate of one litre in 2017 (Oct)
Petrol	₹ 29.91	₹ 43.52	₹ 67.86	₹ 64.91
Diesel	₹ 18.91	₹ 30.48	₹ 58.97	₹ 54.70

- In 2014, as compared to 2007 the rate of petrol went up by _____ rupees. The rate of diesel increased by _____ rupees.
- What was the difference in the rates of petrol and diesel from 2002 to 2007, 2007 to 2014 and 2014 to 2017?
- What is the change in prices of diesel and petrol from 2007 to 2014?

Find out

- How much did the price of petrol and diesel change from 2014 to 2017?
- What is the price of petrol and diesel in your area?
- Why are the prices of petrol and diesel going up?
- In one month how much petrol and diesel is used in your home? What is it used for?

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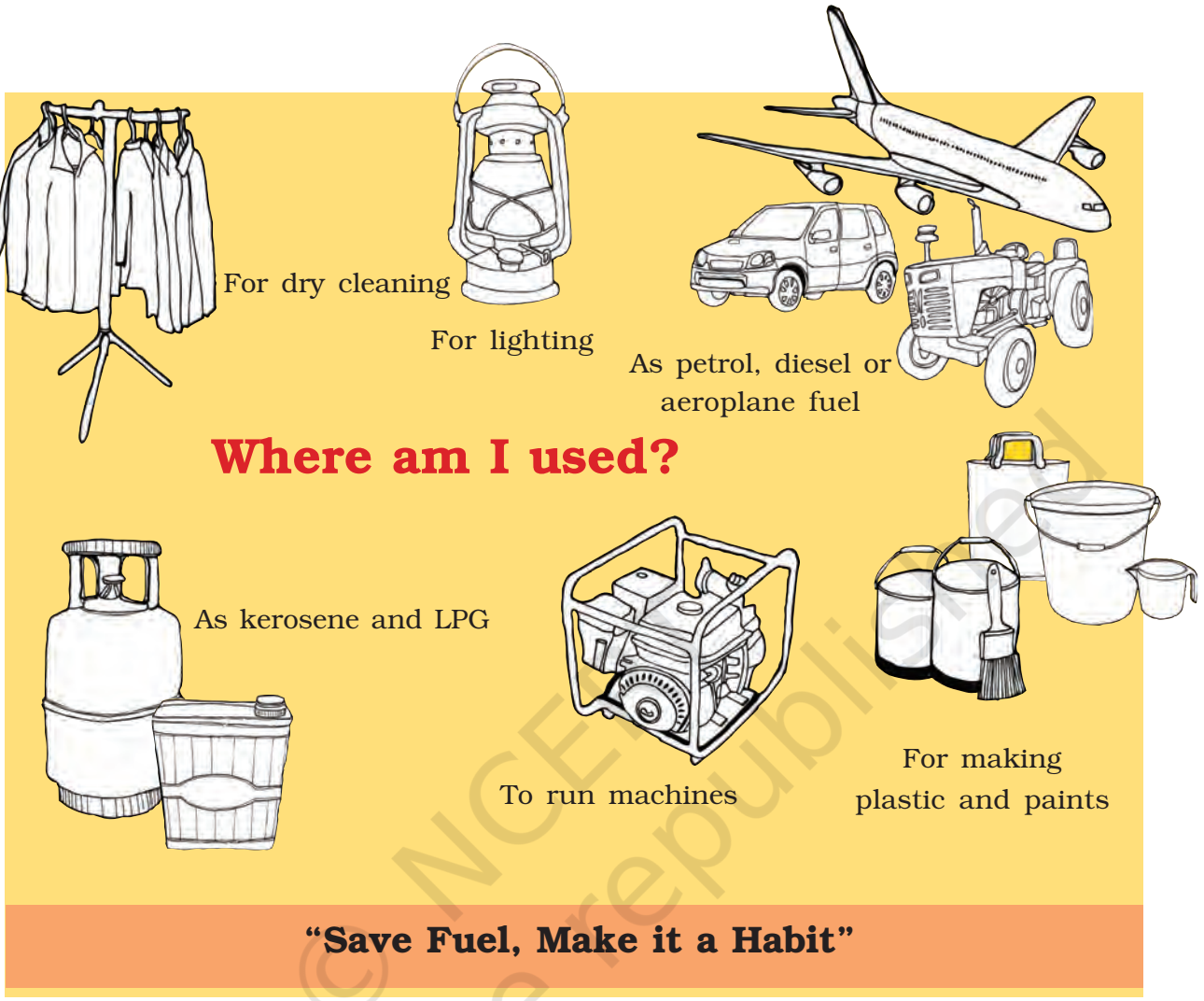
- One poster is given here.



See the poster and write

- Where all is oil used?
- Where is diesel used? Find out.

Teacher's Note : It would be useful to have a discussion on the poster. This will help children understand that petrol, diesel, kerosene, L.P.G. etc. are all different forms of petroleum. These have different uses in our lives. Children will understand the poster better by relating it to their own experiences.

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Divya wrote a poem and read it out to her friends. Read and discuss it.

Who Am I?

I'm black, I'm thick,
I flow.
Who am I?
Do you know?
I will last longer,
If you use me with care.
I got made over centuries.
I won't always be there.
I light your lamps,
I cook your food.
I run your machines,
Fly planes in the sky!
Who is more useful
To people, than I?
If not used with care
I won't always be there
Will they fight over me?
What is life without me?
I'm black, I'm thick,
I flow.
Who am I?
Do you know?

(Translated by Anupa Lal)

Think and discuss

- What would happen if you don't get petrol or diesel for a week in your village or town?
- Suggest some ways to save oil.

Wood for *chulha*

Durga lives in a village in Haryana. Everyday she spends many hours collecting wood for the *chulha* (stove). Her daughter also has to help her in this. For the past three months she has a cough. There is a lot of smoke when damp wood is burnt. But Durga does not have any other option. When there is not enough money to buy food, where will there be money to buy wood?

Urja Bharti

Discuss

- Have you ever collected dry wood or made cow dung cakes? How are they made?
- Do you know anyone who collects dry wood or leaves to be used for lighting a *chulha*?

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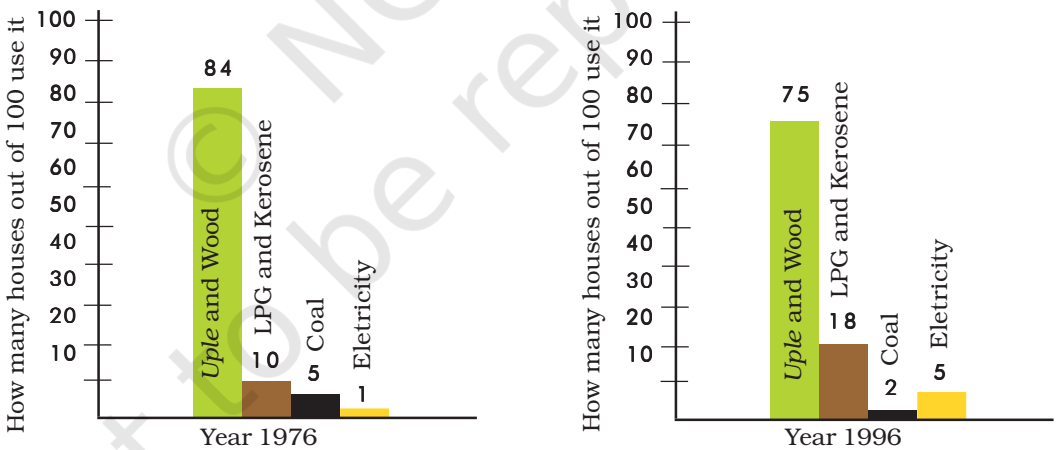
- Who cooks food in your family? What about other families in your area?
- If they cook food using wood or *upla* (cow dung cakes), what difficulties do they face due to smoke?
- Can Durga use anything else instead of wood? Why not?

Today, about two-third (2/3) people in our country use *uple*, wood and dry twigs, etc. These are used not only for cooking food but also for keeping warm, for heating water and for lighting. Many other things are used for all activities at home – kerosene, LPG, coal, electricity, etc.

Urja Bharti

Kancha had seen a **bar chart** in a book. The chart shows the number of houses out of 100 that use each type of fuel. It also shows the use of which fuel has increased and which fuel has decreased over the past twenty years.

Change in fuel use over twenty years



– In year 1976, out of 100 how many houses used *uple* and wood?
– Which was the fuel used the least in 1976?
– In 1976, LPG and kerosene were used in_____houses and in 1996 this increased to_____. This means that in twenty years their use increased by_____%.

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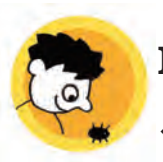
– Out of 100, how many houses were using electricity in 1996?

– Which fuel was used the least in 1996? What percentage of houses used it in the year 1976?



Find out from your elders

- When they were young what was then used to cook food at home?
- In the past 10 years use of which cooking fuel has increased in your area? Use of which fuel has decreased?
- Guess the use of which fuel would increase and which would decrease in the next 10 years.

What we have learnt

- Imagine that a company has given you a chance to design a new vehicle like a mini bus. What kind of vehicle would you design? Write about it. Draw a picture and colour it.
- While making the design, who did you plan to take care of:

  old people _____

  children _____

  those who cannot see? _____
- Look out for news reports on oil. Cut these and make a collage. Put up a chart in your classroom. Also write your own views on these news reports.
- Make a poster with a message on saving fuel. Write a slogan too. Where would you like to put up this poster?

Teacher's Note : Encourage children to relate the use of the term 'per cent' to other instances from their lives, such as – chances of winning a game, marks in a subject. discount sales, etc.

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0529CH13

13. A Shelter so High!

A traveller's tale

Gaurav Jani

I am Gaurav Jani and this is 'Loner' – my partner – my motorcycle. But, Loner is never lonely. We are together all the time.

I and my motorcycle wait for a chance to get away from the busy, crowded and noisy city of Mumbai. We like to travel to different parts of this wonderful country. Let me tell you about our amazing journey on the highest roads in India.

Getting ready

This journey took about two months. I had to carry everything on my motorcycle. I had to plan and collect all the things I needed. I packed a small tent, sleeping bag, plastic sheet, warm clothes and food that would remain fresh for some days. I also took my camera and extra cans for petrol. Loner and I left Mumbai, passing through small villages and towns of Maharashtra, Gujarat and Rajasthan to reach Delhi.

It took me three days to cover 1400 kilometers from Mumbai to Delhi. I was hoping to see something new and different in Delhi. But Delhi looked just like Mumbai! I am tired of looking at the same kinds of houses, made of cement, bricks, glass and steel. I was looking forward to my journey ahead. I was

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excited that I would be able to see wooden houses, houses with sloping roofs and those covered with snow. I had seen pictures of such houses in many books.

I packed more things in Delhi and continued. In two days we were in Manali. It was so refreshing to be in the mountains and breathe the clean air! Now the real journey was to begin. We had to travel through difficult roads of the state of Jammu and Kashmir to reach Leh in Ladakh.

Find out

- Check in your map. Which states would one pass through while travelling from Mumbai to Kashmir?
- Gaurav Jani passed through several states while going from Mumbai to Delhi. Find the capital cities of these states. Was there any other big town on his way?
- Is Manali a plain or a hilly area? In which state is it?

Gaurav Jani

New home

Loner and I were covering long distances each day. All I needed was food and a tent to protect myself from the cold night air. My nylon tent was so small that I could just about fit in it to sleep.

Loner stood guard outside the tent. The breeze and the sound of the birds woke me up to see the sunrise.

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Tell

- Have you ever stayed in a tent? Where? What was it like?
- Imagine that you were to stay alone in a small tent for two days and could take with you only ten things. Make a list of those ten things.
- What are the different types of houses that you have seen? Tell your friends about it. Make drawings too.

Gaurav Jani

Cold desert

At last Loner and I reached Leh. For the first time I saw such an area – high, dry and flat called a cold desert. Ladakh gets very little rainfall. Here there are high snowcapped mountains and a cold, flat ground.

In Leh, I found myself in a quiet street with beautiful white houses. As I rode slowly, I found that I was being followed by a group of children. They called out 'jule, jule', meaning 'welcome, welcome'. They were all amazed to see my 'Loner'. Everyone wanted me to come to their home.

At home with Tashi

Tashi dragged me to his home. It was a building with two floors. The house was made of stones which were kept one over the other. The walls were coated with a thick layer of mud and lime. The house looked like a shed from inside with a lot of hay

Teacher's Note : Discuss with children that all the deserts are not hot and sandy. Encourage students to look at the map and find all the states mentioned in the chapter.

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stored there. We took the wooden steps and reached the first floor. "This is where we stay," explained Tashi. "The ground floor is for our animals and for storing necessary things. Sometimes when it gets too cold, we also move downstairs."

Gaurav Jani

I noticed that the ground floor had no windows. Thick tree trunks were used to make the roof strong.

Tashi then took me to the roof of his house. What a view! I could see the same flat roofs all around. On some red chillies were, laid out to dry and on some there were orange pumpkins and golden yellow corn. Some had stacks of paddy and on some cow dung cakes were laid out to dry.

"This is the most important part of our house," said Tashi. "During summer season we dry many fruits and vegetables. We store them for winters when we do not get fresh fruits and vegetables."

As I stood there with Tashi I could see how every part of the house was built specially to suit the needs of his people. I could understand how the thick walls, a wooden floor and a wooden ceiling protected them from the cold.

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Write

- During winters, Tashi and his family live on the ground floor. Why would they be doing so?
- What is the roof of your house like? What all is the roof used for?

People living on top of the world

Now was the time to climb higher. Loner had a tough time zigzagging along narrow, rocky mountain roads. At many places there were no roads at all.

I was moving towards the rocky plains of 'Changthang'. This place is at a height of almost 5000 metres. It is so high that it is difficult to breathe normally. I had a headache and felt weak. Then I slowly got used to breathing in such air. For many days we kept wandering in this area with not a single human being in sight. No petrol pumps, no mechanics! Only clear blue sky and many beautiful lakes around.

Many days and nights passed. Loner and I kept moving ahead. Suddenly one morning I saw before me flat grassy land. Many sheep and goats were grazing there. Far in the distance I saw some tents. I wondered who lived there and what they were doing in this far out place.

Find out

- At what height is the place where you live?
- Why did Gaurav Jani say - "This place is so high that it is difficult to breathe normally?"
- Have you ever been to a hilly place? Where?
- At what height was it? Did you have any difficulty in breathing there?
- Which is the highest place you have been to?

The Changpa

There I met Namgyal and came to know about the Changpa – a tribe living on the mountains. The Changpa tribe has only about 5000 people. The Changpas are always on the move with their goats and

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sheep. It is from these that they get all that they need – milk, meat, skin for tents and wool for coats and sweaters. Their goats are their only treasure. If a family has more animals it is considered more rich and important. From these special goats they get wool for making the world famous pashmina wool. The Changpa graze their goats at higher and colder places so that the goats have more and softer hair (fur). They stay high up on these mountains in very difficult conditions because that is where these goats can live. This is their life and their livelihood.

Gaurav Jani

I was carrying very little of my belongings on my motorcycle. But the Changpas carry everything that they own on their horses and yaks. It takes them only two and a half hours to pack everything and move ahead. Within no time they put up their tents at the chosen place, the luggage is unpacked and their homes are ready.

"You are most welcome into our home," said Namgyal as he led me to the big cone-shaped tent. They call their tent *Rebo*. Yak hair is woven to make strips which are stitched together. These are strong and warm and protect them from the icy strong winds. I saw that the strips were tightly tied with nine sticks. The ground is dug about 2 feet deep. The tent is then put up around this on the higher part of the ground.

Teacher's Note : In the language of the Changpa 'changthang' means a place where very few people live. Are there words like this in different languages spoken by children? As you go up the mountain, the level of oxygen in air becomes less and at times people have to carry oxygen cylinders. It is not expected that children understand the concept of 'oxygen'. But children may have some idea that it is difficult to breathe on high altitudes. This will make them sensitive towards people living in such conditions. Through this they will also understand all kinds of difficulties people have to face for a living.

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The world famous pashmina

It is believed that a pashmina shawl is as warm as six sweaters! It is very thin yet very warm. The goats from which the soft pashmina wool is collected, are found on very high altitudes of 5000 metres. In winter, the temperature here drops below 0° C (–40° C). A coat of warm hair grows on the goat's body which protects it from extreme cold. The goats shed some of their hair (fur) in summer. This hair is so fine that six of these would be as thick as one hair of yours!

The fine hair cannot be woven on machines and so weavers of Kashmir make these shawls by hand. This is a long and difficult process. After almost 250 hours of weaving, one plain pashmina shawl is made. Imagine how long it would take to make a shawl with embroidery.

As we stepped into the tent I realised that I could stand up straight. It was not like my tent. I also saw that the *Rebo* was as big as a room of my flat in Mumbai! It was held up by two wooden poles in the middle. There was an opening to let out the smoke from the *chulah*. Namgyal told that, the design of this tent is more than a thousand years old. The tent protected the Changpas from extreme cold.

Gaurav Jani

Rebo

How cold must it be? In winters the temperature drops many degrees below zero! The wind blows at 70 kilometres per hour. Imagine–if you were on a bus which was going at this speed, how far from your house would you reach in one hour?

Near the *Rebo* there was a place to keep sheep and goats. Changpas call

Teacher's Note : We can discuss with children that there are different kinds of houses in different regions. The same area may also have different kind of houses. The reasons include climate, economic conditions and also the availability of local raw material (stone, mud, wood).

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this *lekha*. The walls of a *lekha* are made with stones. Each family puts a special mark on their own animals. The women and young girls count and take the animals out of the *lekha*.

– For the Changpas their animals are a very important part of their life. Is any animal part of your life? For example, as a pet, or as helpers in farming.

– List five ways in which different animals are a part of your life.

– Do goat and sheep need their own fur and wool? Discuss.

Find out

- You read that in Changthang the temperature drops below 0°C. Look at newspapers on the TV to find cities in India or abroad where the temperature drops below 0°C. In which months do you expect to see this?

Towards Srinagar

I spent a few days with the Changpas but, sadly, it was time to move on. My return journey would take me away from this special part of the world, towards towns which looked like a totally different world. This time I took a different route from Leh. I was going towards Srinagar via Kargil. I saw many more amazing buildings and different houses.

I stayed in Srinagar for a few days. I was amazed by the houses there. They took my heart away! Some houses are on the mountains, while some are on water. I took many pictures of these. See my photo album (p. 128).

Teacher's Note : Children at this age are not expected to understand the concept of temperature. But using newspaper reports and linking °C with their experiences of hot or cold will help them make some associations. This also provides an opportunity to know the names of some new cities in which the temperature drops below 0°C.

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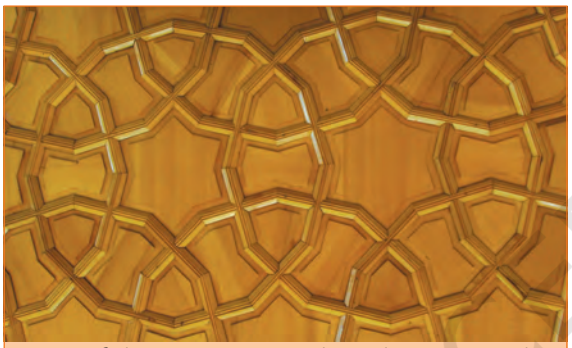
Houses of Srinagar – My photo album

Vinod Raina

Tourists who come to Srinagar love to stay in houseboats. Houseboats can be as long as 80 feet and around 8 to 9 feet wide.

Afaq Ghada

Many families in Srinagar live in a 'donga'. These boats can be seen in Dal Lake and Jhelum river. From inside the 'donga' is just like a house with different rooms.



Afaq Ghada

Beautiful carving on wood can be seen on the ceiling of houseboats and some big houses. This design is called 'khatamband', which has a pattern that look like a jigsaw puzzle.

Afaq Ghada

In villages of Kashmir, houses are made from stones cut and kept one on top of the other and coated with mud. Wood is also used. The houses have sloping roofs.

Afaq Ghada

Some old houses have a special type of window which comes out of the wall. This is called 'dab'. It has beautiful wood pattern. It is wonderful to sit here and enjoy the view!

Afaq Ghada

The old houses here are made of stone, bricks and wood. The doors and windows have beautiful arches (*mehraab*).

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When I started my journey, I had not imagined that in one state I would see so many different kinds of houses and lifestyles. I had a wonderful experience of living on the mountains in Leh and another of living on water in Srinagar. I saw how both the houses in these areas were made to suit the climate.

Tourists enjoy the *Shikara* ride on the dal lake. Vinod Raina

Return journey

Again it was time to move on. In Jammu I saw houses like I have been seeing in Mumbai. The same–cement, brick, steel and glass. These houses are very strong. But they are not as special as the houses I was lucky to see in Leh and Srinagar.

After a long journey Loner and I were about to reach Mumbai. My heart felt heavy. I also felt that my motorcycle did not want to come back. I was happy that I had learnt and experienced so many new things. I had also brought back some memories in my camera. And of course, this was not the end! Next time when Loner and I get bored of the city, we will again set out for a new journey!

Can you tell what is shown in this picture? Every lane in Kashmir has a bakery. Kashmiri people don't cook *roties* in their homes, they buy it from such bakeries. Afaq Ghada

Tell

The houses in different parts of Jammu and Kashmir are made to suit the climate and the needs of the people there.

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- Are there different types of houses in the place where you live? If yes, think about the reasons.
- Think of your own house. Is there something special in it – like a sloping roof as it rains a lot, or a courtyard where you can sleep when it is hot or where things are kept in the sun (for drying, etc.)? Make a drawing.
- What are the materials used for making your house? Is it mud, brick, stone, wood or cement?

Anita Rampal

Discuss and write

- Look at this picture. Can you see any houses in the picture? These houses are made of stone and mud. Nobody lives here in winter. In summer, the Bakarwal people live here when they bring their goats to higher lands for grazing.
- Can you guess the similarities and differences in the life of Bakarwal people and the life of the Changpas.

What we have learnt

You read about different kinds of shelters in Jammu and Kashmir – some on high mountains, some on water, some with beautiful designs in wood and stone, and some mobile shelters that can even be packed and carried to another place.

- Describe how these shelters suit the needs of the people who live there.
- How are these different from the house you live in?

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14. When the Earth Shook!

0529CH14

A bad dream

Help! Help! Save me! Aaahhh! Oooooww… There was screaming and shouting everywhere. The ground was shaking and people were running all around.

Screaming loudly I got up. On hearing me my mother also woke up. She came running and held me tight. It was the same bad dream! It has been more than six years now since the earthquake. But in my sleep I still feel the earth shaking and trembling.

I am Jasma. I live in the Kutch area of Gujarat. I was eleven years old when there was an earthquake.

It was 26 January, 2001. Everyone from the village – children and old people – had gathered in the ground of the school to watch the parade on TV. Suddenly the ground was shaking. People were scared and started running here and there. No one knew what was happening and what to do. There was total panic!

Teacher's Note : Talking to children about the earthquake in Bhuj would help them understand the context. The effects of an earthquake can also be discussed.

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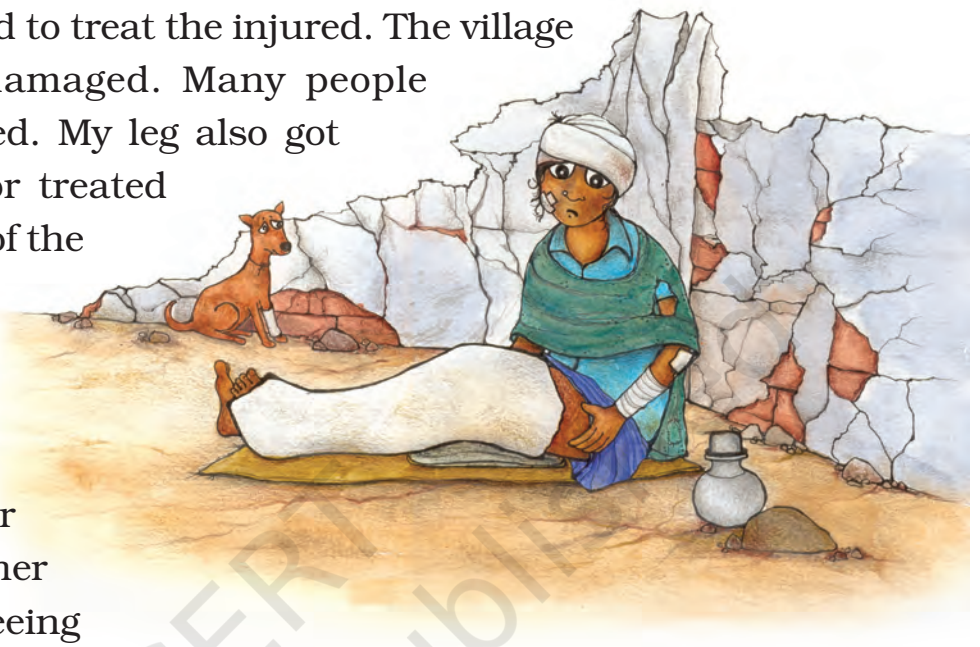
In a few minutes, our village was flat on the ground. All our things – clothes, pots, grains and food – were trapped under the stones, mud and wood from the fallen houses. At that time everyone thought of two things – to save the people who were trapped and to treat the injured. The village hospital was also damaged. Many people were seriously injured. My leg also got fractured. The doctor treated people with the help of the villagers.



Six people of our village died. My grandfather (*Nana*) was also buried under the houses. My mother wept all the time. Seeing my mother, I also cried. The entire village was sad and disturbed.

House of Motabapu who is the *sarpanch* of our village was not much damaged. He gave rice and wheat to everyone from his godown. For many days, the village women cooked food together at Motabapu's house and fed everyone.

Imagine, being without a house in the cold winter! Fear and the cold kept us awake in the nights. All the time we were worried that there may be another earthquake.

Discuss and write

- Have you or anyone that you know ever faced such difficulty?
- Who all helped at such a time? Make a list.

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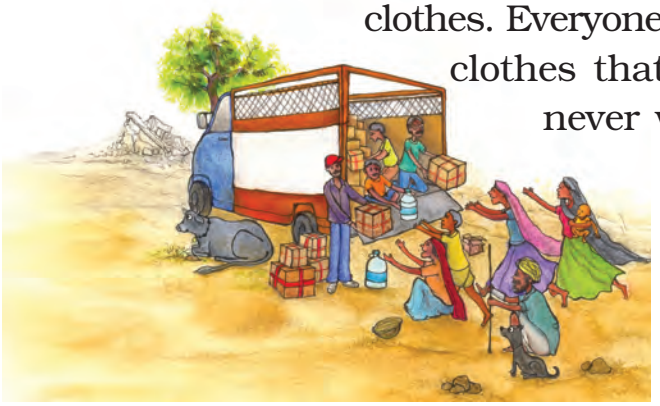
Help arrives

For some days after that, people from the cities kept coming to see what had happened. They came with food, medicines and clothes. Everyone used to rush to take these things. The clothes that we got were very different. We had never worn such clothes before.



People from different groups from the city, helped us to put up the tents. Staying in these plastic tents in the cold winter months was very difficult.

Some of these people were scientists. They tried to find out which areas have more chances of having an earthquake. People from our village talked to them many times. They had suggestions about building our houses again. Engineers and architects showed us some special designs for houses. They said that with this design, houses would not get damaged much in an earthquake. But our people were a little afraid. They thought if these people build our houses, our village will not look like our old village. So, the villagers thought they would build their own houses with their help. The groups would build the village school.

We all worked together to rebuild our village. Some people dug and brought the clay from the pond. We mixed the clay with cow dung and made large cakes. We put these on one another to make the walls. We whitewashed the walls and decorated them with beautiful designs and small pieces of

Teacher's Note : Talk to the children about government agencies and voluntary groups. For this, examples from their own area can be taken. A discussion can also be held on the kind of work engineers and architects do.

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mirrors. We put up the thatched roof. Now our house shines like a diamond in the dark night!

Discuss

- A lot of people from other places came to Jasma's village. Who were these people? In what ways would they have helped the villagers?
- People in Jasma's village rebuilt their houses with suggestions from the engineers. Will these houses be safer than before in case there is an earthquake again? Why?
- Think, if there were an earthquake where you live, would your house be in danger?
- What will you do to save pet animals during natural disaster?

Write

- Compare your house with that of Jasma. List in your notebook what materials were used in making both the houses.

Jasma's House	Your House
_____	_____

What will you do?

People from the groups also made children in Jasma's school practice what they should do in case there is an earthquake. This is what they said:

- If possible leave the house and go to an open ground.

Teacher's Note : Talk to the children about what all can be done if there is a warning about such disasters.

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- If you cannot go out of the house, lie down under a strong thing like a table and hold on tightly, so that it does not slip away. Wait until the shaking stops.

- Have you been told in your school or anywhere else about what to do in case of an earthquake?
- Why do you think one should go under a table during an earthquake?

Come practice, what to do in an earthquake

Who helped?

Read this TV report on the Bhuj earthquake.

Sunil Jacab

Ahmedabad, January 26, 2001

At least a thousand people are feared dead in the earthquake that struck Gujarat this morning. Many thousands have been injured. Army jawans have been called in to help.

At least a hundred and fifty buildings have fallen in the city of Ahmedabad. In these, there are a dozen multi-storeyed buildings. By this evening, around 250 bodies have been removed from these buildings. It is feared that several thousand people may still be trapped. Rescue efforts are on. There is perhaps no building in the city which has not developed cracks.

The situation in Bhuj is even worse. People are running around in shock and panic. Within an hour of the earthquake the fire engines had reached and started work along with the local people. Offers to help are coming from all corners of the country and abroad.

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Write

- According to the TV report, thousands of people were injured and some died in Gujarat. If the buildings had

been made in a way that they would not fall in the earthquake, would the damage have been different? How?

- At times like this, when people have lost their homes and all their belongings, what kind of help would they need?
- In such situations whose help would be needed and for what? Write in your notebook as shown here.

Whose help will be needed	How will they help
1. Dog	To smell out where people are lying trapped
2. _____	_____

Discuss

- Have you ever seen people in your area helping each other? When?
- Why do people live together in a neighbourhood?
- Imagine living in a place where there were no other houses or people around. How would it be? For example, whom would you play with? With whom would you celebrate festivals and special days? Would you be scared?
- People face a lot of difficulties when they lose people from their family, or their houses and belongings. In newspapers of the last one month, look for news related to such disasters – earthquakes, floods, fire, cyclones, etc., in different parts of the world. Collect these news reports and paste them in your notebook.

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Your news report

- Make your own report which mentions the following:
  - Cause of the disaster, date and time
  - What kind of damage did it cause – to lives, belongings, livelihoods?
  - Which people came forward to help? Which government offices or other groups?

  If there is no rain, crops can fail and there can be a **drought**. But food for people can be brought from other places so that there is no **famine**, which means people don't have to stay hungry, and they don't die of hunger.
- Have people in your area ever got affected by famine or drought? Find such reports of different countries from newspapers. Make your own report.
- You may need some help from these in case of an accident or emergency. Find out and write their addresses and phone numbers. Add more names to this list.

	Address	Phone Number
Fire Station	_____	_____
Nearby Hospital	_____	_____
Ambulance	_____	_____
Police Station	_____	_____

Difficult times

Write a report with the help of the following words:

floods, river water, injured people, food packets, rescue work, camps, dead bodies, dead animals floating in water, houses

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under water, aerial survey (to see the scene of disaster from a plane), sad people, diseases spread by dirty water, homeless people, trapped people.

What we have learnt

What type of difficulties are faced by people during floods? Look at the picture, what kind of a school have the children come to after the flood? Write down what people had to do to make their life normal again after the flood.

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Teacher's Note : In a discussion about the importance of a neighbourhood, various examples like daily interactions, weddings or a death in the neighbourhood can be taken. After collecting articles from the newspaper, children can work in different groups on different disasters. Discuss how different people are affected by disasters differently. For example, farmers are the most affected by floods, fishermen by tsunami, etc. Encourage children to watch film on disaster preparedness, assemble kits and participate in mock drills. Refer to the following weblinks - http://www.ndma.gov.in/en/

15. Blow Hot, Blow Cold

0529CH15

There was a woodcutter. Everyday in the morning he used to go to the forest to cut wood. In the evening he would sell the wood in the city. One day he went deep into the forest. It was a very cold winter. His fingers were becoming numb. Every now and then, the woodcutter would put down his axe and bring his hands close to his mouth. Then he would blow hard on them to warm them.

While he was cutting wood Mian Balishtiye was watching him from a corner. Mian Balishtiye saw that the woodcutter kept blowing on his hands. He began to wonder what all that was about! But he could not understand it. He got up thinking that he would go and ask the woodcutter. After walking a little, he came back thinking that the woodcutter may not like being asked. Finally, Mian Balishtiye could not help himself. He went hopping to the woodcutter and said, "Hello brother, if you don't mind can I ask you something?"

Seeing this tiny person the woodcutter was amazed and amused. But, he hid his smile and said, "Of course, of course, ask what you want to." "All I want to ask is why do you blow from your mouth on to your hands?" said Mian Balishtiye.

Teacher's Note : It would be good for the children to know that this story has been written by Dr. Zakir Hussain, former President of India. He has written many stories for children. It could be discussed why an imaginary character like *Mian Balishtiye* could have been used.

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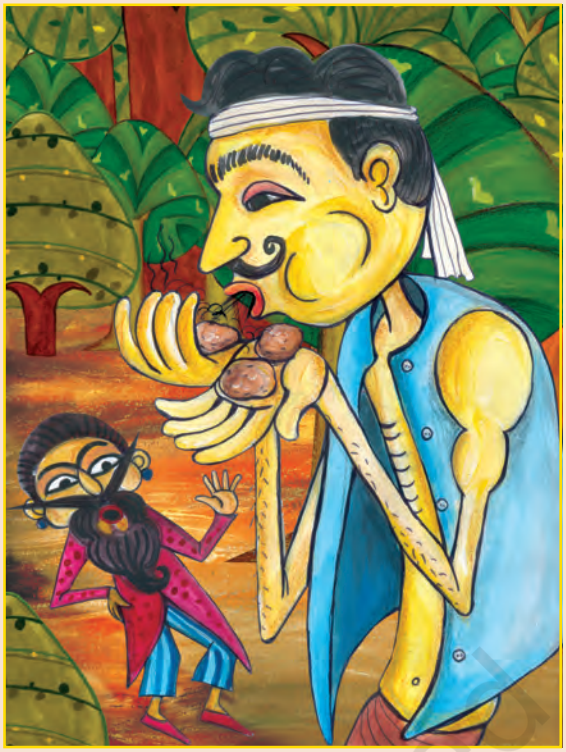

The woodcutter replied, "It is too cold. My hands are frozen, so I blow on them to warm them up a little. Then, when they get cold again I warm them again by blowing."

Mian Balishtiye nodded, "Oh, ho, so that's it!"

And with that he moved off. But he stayed nearby and kept a close watch on him.

Soon it was afternoon. The woodcutter began to think of lunch. He picked up two stones and made a *chulha*. He lit a fire and put a small *handi* (pot) filled with potatoes to boil. The wood was damp, so the woodcutter bent down and blew on the fire to help it burn. Balishtiye was watching him from a distance. "*Arre*", he said to himself, "There he goes again – blowing from his mouth! Does fire come out of his mouth?"

The woodcutter was feeling very hungry. He took out a potato from the *handi*. He tried to eat it but the potato was too hot. He again began to blow on it – 'foo, foo'.

"*Arre,*" said Balishtiye to himself, "He's blowing again! Now what? Is he going to burn the potato?" After blowing a few more 'foo, foos' on it, the woodcutter put it in his mouth and began to eat it.

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Now Mian was very surprised! He just could not stop himself and off he went hopping to the woodcutter. "Hello brother", he said, "If you don't mind, can I ask you a question again?"

The woodcutter replied, "Not at all. Ask whatever you want."

Mian Balishtiye said, "This morning you told me that you blew on your hands to warm them up. Now you are blowing on this potato, which is already so hot. Why do you want to make it hotter?"

"No, no, my little friend. This potato is too hot. I am blowing on it to cool it down."

When he heard this, Mian Balishtiye's face became white. He began to tremble with fear, and started to back away.

The woodcutter was a good man. He said, "What's wrong Mian? Are you trembling because of the cold?"

But Mian Balishtiye kept going backwards. When he was a safe distance away, he said to himself, "What kind of a creature is this? Surely he must be a ghost or a djinn. Blow hot, blow cold with the same breath! It is just not possible!"

That's right there are some things which just cannot be – but they are!

– Zakir Hussain

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Do this

Miya Balishtiye was confused when he saw the woodcutter blowing on his cold hands to make them warm and on the hot potatoes to cool them.

- Have you warmed your hands in winter by blowing on them when they are cold? How does it feel?
- Blow hard from your mouth onto your hands. How did you find the air from your mouth as compared to the air around? Was it hotter, or cooler?

- Now put your hands at some distance from your mouth, and blow again. Does the air from your mouth feel warm? Why?

Think and tell

Can you think of any other way in which you use the warmth from your breath?

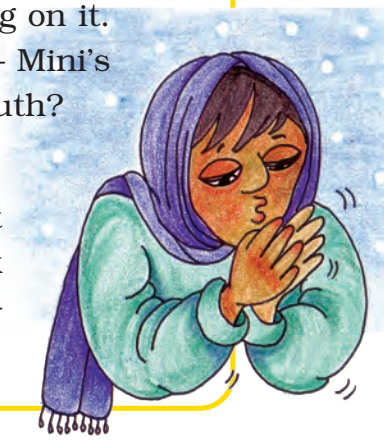
- Fold a piece of cloth 3-4 times. Now bring it close to your mouth and blow hard on it. Did the cloth become warm?
- Balishtiye saw that the woodcutter was trying to cool the hot potatoes by blowing on them. What would have happened if he had eaten the potatoes without cooling them?
- Have you ever burnt your tongue when you ate or drank something that was too hot? How do you cool some food when it is too hot?
- If you were to cool these three hot things – *dal*, *roti*, rice – in which ways would you do so?

Picture 1

Mini tried to cool her tea by blowing on it. Which do you think will be hotter – Mini's tea or the air she blew from her mouth?

Picture 2

Sonu was feeling very cold. He kept blowing on to his hands. Now think and write, which will be cooler – Sonu's hands or his breath?



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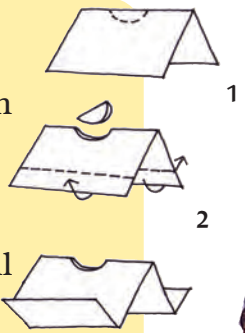
- For what other things do you blow air from your mouth?

Make a paper whistle

- Take a piece of paper 12 cm long and 6 cm wide.
- Fold the paper into half (as in picture 1).

  Tear it off a little in the centre to make a small hole (as shown in picture 2).
- From both the sides, fold the paper upwards (picture 3).
- Hold the paper between your fingers and put it to your mouth.
- Blow on it and hear the whistle. Whose whistle was louder - your's or your friend's?
- Blow gently and also blow hard and make different sounds.



Blow in different ways

- Make whistles of the things given below. Write in a sequence–from the loudest to the softest whistle.
  - Wrapper of a toffee _____
  - A leaf _____
  - A balloon _____
  - The cap of a pen _____
  - Any other thing _____

Teacher's Note : Children take time to understand the concept of hot and cold air. Through the activity, we can try to enable children to understand that the air coming out of our mouth can be cold or hot as compared to the temperature outside. It is not expected that children will be able to understand all this at one go. It is important to link this concept with different experiences of children.

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- Have you seen people playing different musical instruments like *flute, dholak, been ...., guitar, mridang*, etc. Can you recognise their sounds with your eyes closed? Find out more about these musical instruments. Collect their pictures too.

Write

- Can you name some things which produce melodious or pleasing sounds when we blow into them.

Do this and discuss

- Have you seen someone blowing on their spectacles to wipe them clean? How does the air from the mouth help in cleaning the spectacles?
- Take a glass. Bring it near your mouth and blow hard on it. Do this two or three times. Does the glass look hazy?
- Can you make a mirror hazy in the same way? Can you tell by touching the mirror what made it hazy? Is the air you blew from your mouth dry or wet?
- Put your hand on your chest. When you breathe in, does your chest come out or go in.

Measure your chest

– Take a deep breath in

– Ask your friend to measure your chest with a thread. Measurement_____

Teacher's Note : Air blown out from our mouth is hot and the mirror cold. The hot air that we breathe out contains water vapour which turn into tiny droplets of water when it comes in contact with the colder mirror. This makes the glass moist and hazy.

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– Now breathe out. Again ask your friend to measure your chest. Measurement_____

– Was there any difference in the two measurements of your chest?

How many breaths in one minute

– Put your finger under your nose. Can you feel any air when you breathe out from your nose?

– Count how many times in one minute do you breathe in and breathe out.

– Jump 30 times. Did you feel breathless?

– Now again count how many times in one minute you breathed in and out.

– What was the difference in your count before and after jumping.

The clock inside you

You have all heard the 'tick tick' of the clock. Have you seen a doctor using a stethoscope to listen to our chest? What do you think she hears? Where is the sound coming from? Is there a clock inside your chest that keeps ticking away?

Do you want to listen to your heartbeat? Take a rubber tube as long as the distance from your shoulder to your elbow. At one end of the tube fix a funnel. Place the funnel on the left side of your chest. Put the other end of the tube to your ear. Listen carefully. Did you hear a *dhak dhak* sound?

Teacher's Note : To help children time one minute the teacher can say 'start' and 'stop' in the activity for counting breaths.

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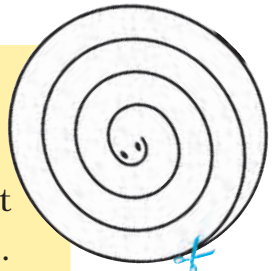
Snake tells the flow of air!



Picture 1

- For this take a round paper 10-15 cms wide. Cut this paper in a spiral shape (as shown in picture 1).
- To hold this snake tie a thread on both sides.
- Tie a knot or a button to make it hang. Now the snake is ready to move.
- Hang this snake near a hot thing. For this you can take hot tea, water or a burning candle. Now see from the top, in which direction the snake moves.
  - Whenever the air flows upwards it will move in a clock-wise direction. When the air flows downwards the snake will move in the opposite direction.
  - Stand with this snake below a fan. Look in which direction it moves. Take this paper snake to different places and observe its movement.
  - Can you understand from the movement of the snake - if the air is moving upwards or downwards?

Picture 2

What we have learnt

- While playing, Amit hit a wall. His forehead was swollen. *Didi* immediately folded a scarf (4-5 times), blew on it and kept it on Amit's forehead. Why do you think *didi* did this?
- We blow to cool hot things as well as to warm them. Give examples of each.

Teacher's Note : The 'snake game' can give an idea to children about the direction of air flow. When the hot air rises the snake moves in a clockwise direction. When the cold air comes down (as it is heavier) the snake moves in an anti-clockwise direction as happens under a fan. To find out the direction in which the snake is moving we must remember to view it from above.

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16. Who will do this Work?

0529CH16

Have you seen such scenes around you?

Sudharak Olve

Have you ever thought of people who do this work? What is our responsibility to keep the place clean?

Why do you think people need to do this kind of work?

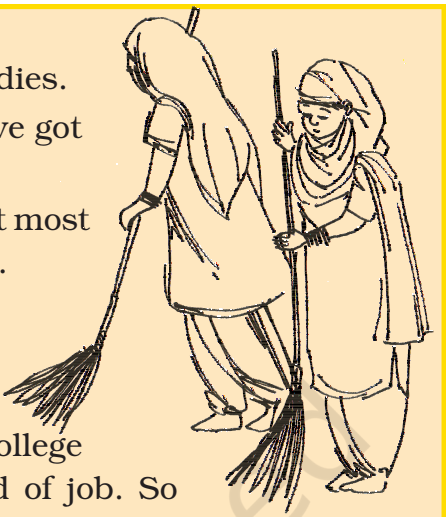
Our friends spoke to some staff who do cleaning jobs. Here are some of the things they told us.

Q. Since when have you been doing this work?

A. About twenty years. Since I completed my studies.

Q. Why did you not study further? You could have got some other job?

A. You need money for studies. And even after that most of our people continue to do this kind of work.



Q. What do you mean?

A. Since our great grandfathers' times... or even before that, most people of our community have been doing this work. Even after getting a college degree, our people do not get any other kind of job. So they have to do this work.

Q. Why is that so?

A. That is the way it is. In the entire city, all the people who do this kind of work are from our community. It has always been so.

Interview (adapted) from the documentary film 'India Untouched' by Stalin. K.

Write

Talk with people who do the cleaning job around your house and school.

- Since when have they been doing this work?
- How much have they studied?
- Have they tried to look for some other work?
- Did the elders in their family also do this work?
- What kind of difficulties do they face in doing this work?

Teacher's Note : Before children talk with the staff which does cleaning , discuss the kinds of questions that could be asked. Sensitise children to be respectful during their interactions.

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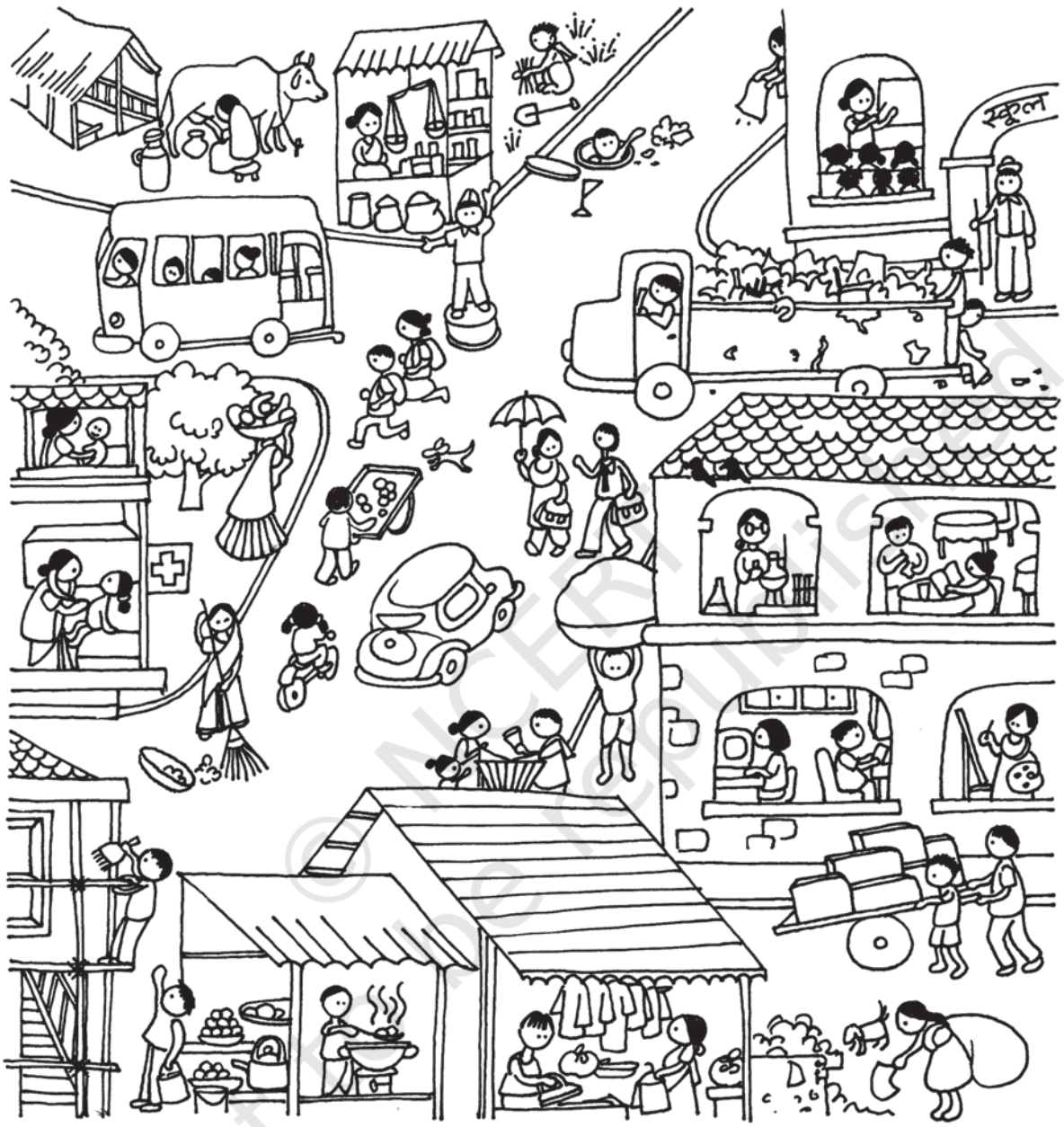
- What are the different kinds of work being done in this drawing? List any five of these.



- If you were asked to do any five jobs shown in this picture, which would you choose? Why?
- Which five jobs would you not choose? Why?

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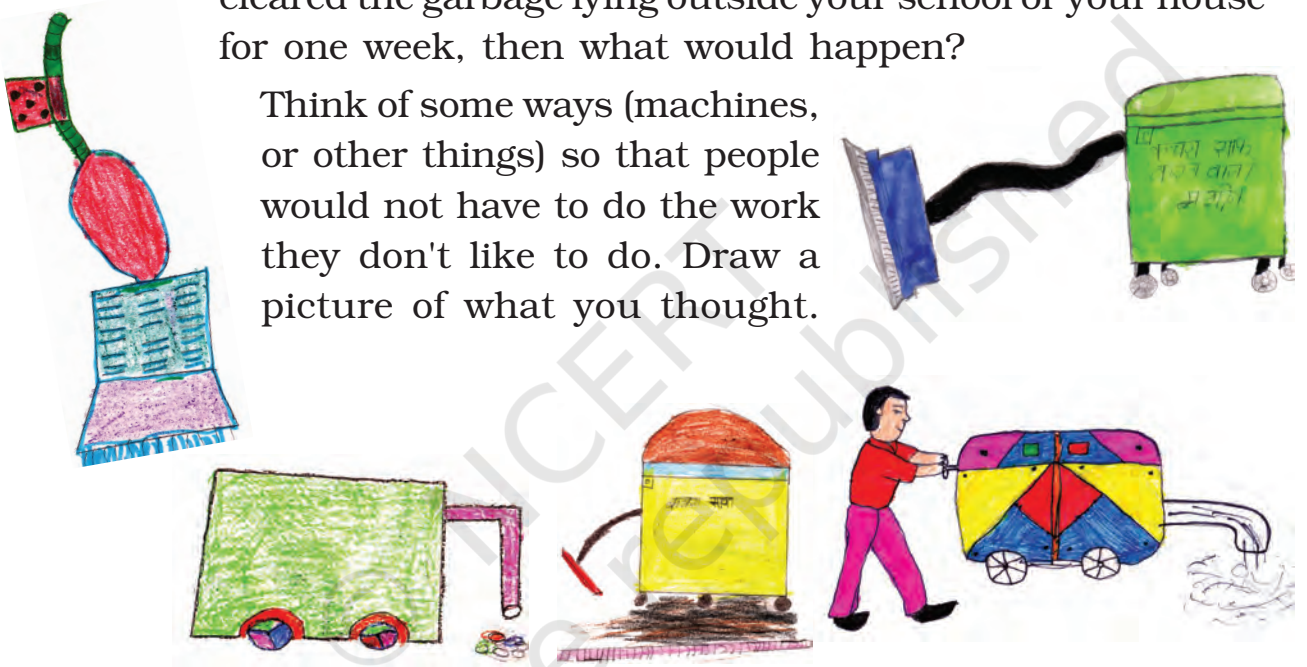
Discuss

- What kinds of work or jobs do people not want to do? Why?
- So, who does this kind of work? Why do people do this kind of work that others do not want to do?

Imagine

- What would happen if nobody did this work? If nobody cleared the garbage lying outside your school or your house for one week, then what would happen?

Think of some ways (machines, or other things) so that people would not have to do the work they don't like to do. Draw a picture of what you thought.



(*These pictures are also made by children*)

Do you think that anyone has ever tried to change this situation? Yes, many people have tried. People are trying even today. But it is not easy to change this. One such person was Mahatma Gandhi. Gandhiji had a friend Mahadevbhai Desai. Mahadevbhai's son Narayan also stayed with Gandhiji when he was young. This incident is from Narayan's book.

Teacher's Note : Discussion can be organised with the people who are involved in bringing such changes in the community. News items on issues related to 'untouchability' can be used in the class to develop sensitivity.

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Remembering those days

When Narayan (Babla) was about 11 years old, he was staying in Gandhiji's Sabarmati Ashram. Like everyone else in the Ashram, he had to do various kinds of work. One of his jobs was to teach the guests how to clean the toilets. In those days, the toilets were not what we know today. There used to be holes under which baskets were kept. People sat on the holes. Later the baskets had to be lifted by hand, to be emptied.

It was the usual practice that people from a particular community would do this work. But in Gandhiji's Ashram, every person had to carry the basket to the compost pit and empty it there. No one was excused from this task - not even the guests. Narayanbhai remembers how some people used to try and avoid this work. Some even left the Ashram because of this.

Some years later Gandhiji went to stay at a village, near Wardha in Maharashtra. Gandhiji, Mahadevbhai and others started to clean the toilets in the village. They did this for some months. One morning a man coming from the toilet, saw Mahadevbhai. He pointed to him and said "There is a lot of dirt over there. Go and clean that!" When Babla saw this, he was very angry. He thought, the villagers felt that this was not their work. This was for Gandhiji and his team to do. He asked Gandhiji why this was so. Gandhiji replied, "Untouchability is a serious matter. Lot of hardwork will be required to change this."

Narayan knew that the people who usually did this work were thought to be untouchable. He asked "What is the use if the village people do not change their thinking? They have become used to someone else doing this work for them."

Gandhiji replied, "Why"? Don't you think the people who clean also benefit from it. They also learn a lesson. To learn something is like learning a new skill. Even if it is a cleaning job."

Little Narayan was not convinced. He again argued, "Those who make a place dirty but do not clean it should also learn lessons." Gandhiji and Narayan continued to argue about this. But when he grew up Narayan always followed the path shown by Gandhiji.

From the book in Gujarati by Narayanbhai Desai – Sant-Charan-Raj, Sevita, Sahaj

Tell

- Why did Gandhiji and his team start doing the job of cleaning. What do you think about this?
- Do you know any such people in your area who try to help others in solving their problems? Find out and discuss in the class.
- Guests at Gandhiji's Ashram had to learn this work also. If you were one of these guests, what would you do?

2024-25

- What are the toilet arrangements in your house? Where is the toilet? Inside the house, or outside? Who cleans the toilet?
- How did the man who was returning from the toilet behave with Mahadevbhai? Why did he behave like this?
- How do people generally behave with those people who clean toilets and drains? Write.

Narayan and Gandhiji discussed all this many years ago. Have things changed now?

A childhood story

This story is almost a hundred years old. Seven-year old Bhim went to Goregaon in Maharashtra with his father to spend his holidays. He saw a barber cutting the long hair of a rich farmer's buffallo. He thought of his own long hair. He went to the barber and asked for a hair cut. The barber replied, "If I cut your hair both my razor and I will get dirty." Oh, so to cut human hair can be dirtier than cutting an animal's hair, wondered little Bhim.

Later this little Bhim was known as Bhim Rao Baba Saheb Ambedkar. He became very famous across the world. Baba Saheb fought for justice for people like him. After India's freedom the Constitution was prepared under the leadership of Baba Saheb.

A conversation in school - the reality today

Hetal : I am Hetal, and this is Meena. We both study in Class III.
Q: What all do you do in school?
Meena: We clean the ground.
Q: Do all children clean?
Hetal : No, not all.
Meena : We also have to clean the toilets. We do it on different days. I clean on Monday, she does on Tuesday, and she on Wednesday ... All the children from our community do this.
Hetal : We have to carry twenty buckets of water for this. We have to sweep and wash.
Q : Why only you? Why not all the children?
Hetal : Only we have to. If we don't we get beaten.

Interview (adapted) from the documentary film 'India Untouched' by Stalin. K.

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Tell

- Who does the cleaning in your school? What all has to be cleaned?
- Do all children like you help in this? If yes, how?
- If all do not help, why not?
- Do all children do all kinds of work?
- Do they sometimes have to miss classes to do this work?
- Do the girls and boys do the same kinds of work?
- What all work do you do at home?
- Is the work done by boys and girls, men and women the same?
- Would you like to bring some change? What kind?

Discuss

- Do people look at different kinds of work in the same way? If not, why is this so? Why is it important to bring change?
- Gandhiji's favourite song (*bhajan*) is given here. This *bhajan* is in Gujarati. Try to understand the meaning of these lines with the help of your elders. Think about these lines.

वैष्णव जन तो तेणे कहिए जे पीड़ पराई जाणे रे,
पर दु:खे अपमान सहे जे मन अभिमान ना आणे रे

What we have learnt

- Gandhiji used to say that every person should do every kind of work. What do you feel about this? If everyone followed this, what are the things that would change? What are some changes that will happen in your own house?

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0529CH17

17. Across the Wall

Stars in her eyes *(Indian Express, 2007)*

Just 13 years old, Afsana Mansuri has already jumped over the wall. The wall between her *jhuggi* and the local basketball court. The wall made by society, for a girl who washes utensils for a living. The gender wall her mother had put up for her.

Today, Afsana herself has become a strong wall of NBA, the Nagpada Basketball Association of Mumbai.

Today, she is the source of strength for five other girls who have come to the basketball court, leaving behind the problems of their everyday lives.

Today, she is the star of a young team. This team has managed to surprise some of Mumbai's club teams. With a lot of guts and courage, the team has reached the semi-finals of a district-level tournament.

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Meeting the team

We read in the newspaper about Afsana and the Nagpada basketball team. We thought of meeting these girls and introducing them to you.

We took the train and got off at Mumbai's Chhatrapati Shivaji Terminus Station (railway station). From there we walked towards Nagpada. It took us just twenty minutes to reach there.

There we met Afsana and the other girls of the Nagpada Basketball Association. Read the interview with the team members.

Meet this special team!

Meet Afsana, Zarin, Khushnoor and Afreen. At first the girls were quiet, but once they started, they just did not stop!

Zarin began, "My house is just in front of this ground. My brother

used to play here. I would stand in my balcony and watch the boys play. I was in Class VII at that time. Whenever the boys played a match, many people came to watch. The winning team got a lot of praise. Everyone cheered the players. On seeing all this, I wished I could also play. Would I too get a chance to show my talent? I asked the coach, but was afraid. He is a good friend of my father. The coach said, "Why not? If you bring some more girls, you can make a team. Then I will teach you."

Find out

- Is there any place to play near your house?
- What do people play there? Who plays there?
- Do the children of your age also get a chance to play there?
- What other things happen at this place?

Teacher's Note : Give opportunities to children to share their experiences about games. Discuss these to build children's understanding on issues, such as, similar games for boys and girls, equal opportunities for all while playing, etc.

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We asked – Was it easy to make a beginning?

Khushnoor: At first my parents refused. But when I insisted they agreed.

Afsana: My mother works in the flats and sends us to school. I also help her. When I told her about my plans to play basketball, Ammi got angry. She said, "Girls do not play basketball. Do your work, go to school and study hard. No need to go to the ground to play." But when my friends and Coach Sir talked to her, Ammi agreed.

Afreen : We were not allowed, because we are girls. My grandmother gets very angry with all of us. But still, we three sisters come here to play. Grandmother scolds us and even scolds our Coach Sir! She tells us, "You need proper equipment to play. You need to have a lot of milk for strength. Where will the money for all this come from?" But daddy understands our feelings. He even teaches us some special moves used in the game. My daddy also used to play on this ground when he was young. He did not have proper shoes or clothes. He used to practice with a plastic ball.

Daddy tells us that Bacchu Khan was the coach when he used to play. He saw my daddy playing once. He realised that the boy played very well and that he should be trained properly. He gave proper shoes and clothes to my daddy. My daddy could have become a very good player. But because of his responsibilities at home, he left the game and took up a job. So he wants us to play and become good players.

Tell

- Has anyone ever stopped you from playing some games? Which games?
- Who stopped you and why? What did you do then?
- Did anyone help you and encourage you to play?

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We asked – Tell us about your team

One girl: We felt a bit strange in the beginning. We were the first girls' team here. People used to come and watch us practicing. They were curious to see how girls would play basketball. Now people are no longer surprised. They have begun to accept that we girls can also play well.

Afsana: I was eleven years old when we first started playing. At that time we were not allowed to go anywhere else to play a match. It has been two years since then. Now we go to other places also for matches. But all this could happen only because of our hard work and Sir's coaching.

Another girl : Yes, we really work hard. Sir is also very strict. We first jog together and then do our exercises. Sir teaches us how to play the game well. We practice how to keep the ball with us, to dodge the players of the other team, how to throw the ball in the basket, to score a goal, to pass the ball well, and to run fast on court.

Afreen: Sir says, "While playing, don't think you are girls. Play like a player. Keep playing even if you get a little injured." We support each other and say – Come on, get up, you will be fine!" Now our game has improved a lot. Everyone says that we play as well as the boys' team.

Teacher's Note : Make different groups of children in class to give them a chance to play different games. Try to encourage the children to play for the team, not for themselves.

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One girl: We also play with boys' teams. We want them to play with us as equals. They should not be lenient because we are girls. Sometimes we get angry when the boys imitate us. But we take it as a challenge and correct our mistakes. If the boys try to cheat, we scold them!

Discuss

- Do girls and boys play different types of games in your school or neighbourhood? If yes, then which games do the boys play and which do the girls play?
- Do you think that there is any difference between the games and the way they are played by boys and girls?
- Should the games for boys and the girls be different? What do you think?

We said – Tell us more about your team.

One girl : Our team is very special. Our team is united. Even if we quarrel, we quickly make up and forget about it. Here we have learnt how to stay and play together. Some of the girls from our team got a chance to play as part of the Mumbai team. The match was at Sholapur.

Zarin : When we went to Sholapur we found that the team had girls from different parts of the state. They did not talk to us nicely and treated us like juniors. They would not even give us a chance to play properly. We felt very bad. There was no cooperation at all in that team.

Teacher's Note : If possible, try to develop an understanding in children that players are recognised by their ability to play rather than by their caste or economic status.

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During the match I threw the ball to one of the team members. But she could not catch it. In turn, she started scolding me, blaming me for the mistake. In all this misunderstanding we lost the match. But this never happens in our own team. If we do miss a basket because of someone's mistake, we do not get angry. We say, "Never mind, next time we will do better!" It is most important to support each other, because we are all part of a team.

Afreen: After playing in Sholapur we realised what was special about our team. Cooperation between us is our strength. We understand and support each other well. Even if every player is excellent, the team can lose a match if all do not play together as a team. To play as a team it is important to understand each other's strengths and weaknesses.

Write

- Have you ever played as part of a team of your class, school or neighbourhood? Whom did you play with? What game did you play?
- What is the difference between playing for yourself and for the team?
- While playing in a team would you like to play for yourself or for the team? Why?
- Is your team like the team Afsana played with at Sholapur or like the Nagpada team? How?

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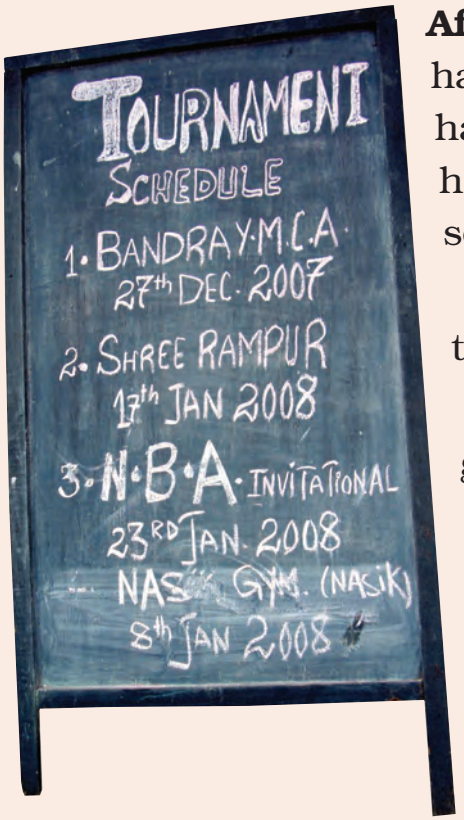
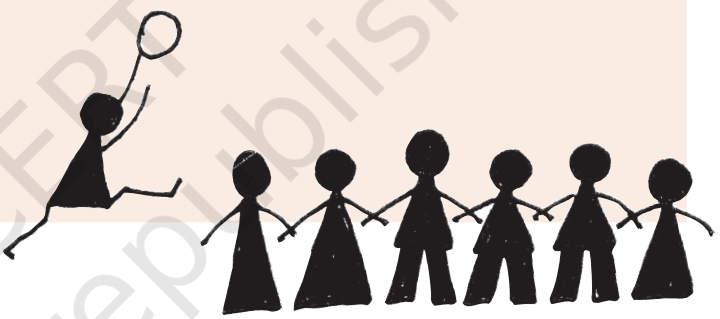
We said – You have done so much. What next?



Afsana: We have been playing well. So we have got a chance to go to many places. We have played for our city and our state. We hope to work hard and play for our country some day.

Yes, then we will also be popular like the cricketers!

We all want to play well. We should bring glory to our area and our country. We want to show that the Indian girls team can win a gold medal! We will make this happen.



Discuss

- Have you ever taken part in some game or competition from your school or area? How did you feel?
- Did you go to some other place to play? What was that place like? How did you like going to that place?
- Have you seen matches being played between India and other countries? Which ones?

Teacher's Note : It is necessary to develop an understanding among children that players are recognised by their perseverance rather than at what level they are playing. If a child plays or participates at the school level with full devotion, that should be the real achievement. It is not important what position he or she secures. In fact, ranking and unhealthy competition needs to be avoided.

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- We all know about the cricketers of India, and we all like them. Do people also know and like the Indian players who play some other games? (Yes or No). What do you feel about it? Do you know the players of the Indian football or kabaddi team?

We asked – Did you face some other difficulties?

Khushnoor: To tell the truth, we have not got all this very easily. As girls, even to be able to start playing was difficult. We had to convince our families. Sometimes we even had to fight. Even today not many girls can play like this. Forget games, earlier some people did not even allow girls to study. My mother wanted to do many things, but she never got a chance. So my mother encourages me to take part in all activities – like games, swimming and drama.

Afsana: Even now, we are supposed to go home as soon as we finish playing. The boys go here and there, and can chitchat till late. No one says anything. After coming from school, I help my mother with the cleaning work in two or three houses, do my studies and then come here to play. I also help at home. If my brother wants tea and he makes it for himself, then mother says, "He has three sisters. Yet, he has to work."

One girl : Now, just look at Zarin's younger brother. He is only five years old but he says, "Mummy, why do you send *didi* to play? She does not look nice playing like that on the ground." Ask him if he will play and he says, "I am a boy, of course I will play!"

Afsana: But it is good for everyone to play. We have now realised, how much we benefit from playing. I want to be such a good player that other girls and boys would wish to be like me.

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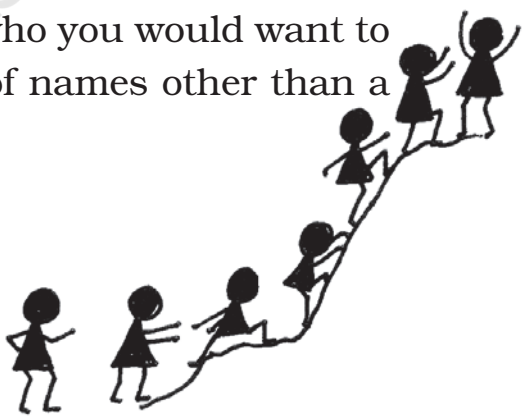
Discuss

- What would happen if girls are not allowed to play games, to study or do some other work of their choice?
- How would you feel if you were not allowed to take part in some game or drama?
- Have you heard of any women players? Name them and the games they play.
- In which areas other than sports have you heard of women getting recognition?
- Are these women less known than men? Why?
- How would you find the world to be, if girls never got a chance to take part in games, drama or dance? How would you feel if such a thing happened to boys?
- Do you know of any woman or girl who you would want to be like when you grow up? (Think of names other than a film actor or a model)



What next?

Afreen: I just want to say that if you have some dreams for yourself, give your best to fulfil them.

Khushnoor: If you have a wish or a dream, have courage to speak about it. If you don't do this now, you may regret later.

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We said – The newspaper wrote about all of you. Now students will read about you in this book. How do you feel?

Afreen: We are so happy about it that we have no words to explain our happiness. We now feel we must play even better, to make our area and our country famous.

All Girls : Yes, this is our wish too.

Coach Sir

The coach who made this team, Noor Khan told us – "This part of Mumbai is very crowded. This is the only playground in this area. This is our small 'Bacchu Khan playground.' A person named Mustafa Khan used to live in our area. Everyone was afraid of him. But children were very fond of him, so everyone started calling him Bacchu Khan. There was no ground then, it was just muddy land. Bacchu Khan used to train children to play. We were among those children. It is because of Bacchu Khan's devotion and training that players from this area are able to compete with the teams of other countries. Like Bacchu Khan, I have trained the children of this area. Today our team has some who play at the international level. Some have even won the Arjuna Award."

Noor Khan continued – "In the last few years we have also prepared a girls team here. Our girls play for the Maharashtra State team. They practice well with good discipline. Our girls and boys come from different types of families. Some are from poor homes, some from richer. Some study in Urdu medium and some in English. But once they come here, they all make a team."

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Think and write

- The newspaper report said, "Afsana has jumped over the wall. The gender wall that her mother had put up for her." Think and write in your own words, what was this wall? What do you understand by 'gender bias'?

What we have learnt

- Should games for boys and girls be different? Think and write what you feel.
- If you are made the leader of a team, how will you prepare your team?

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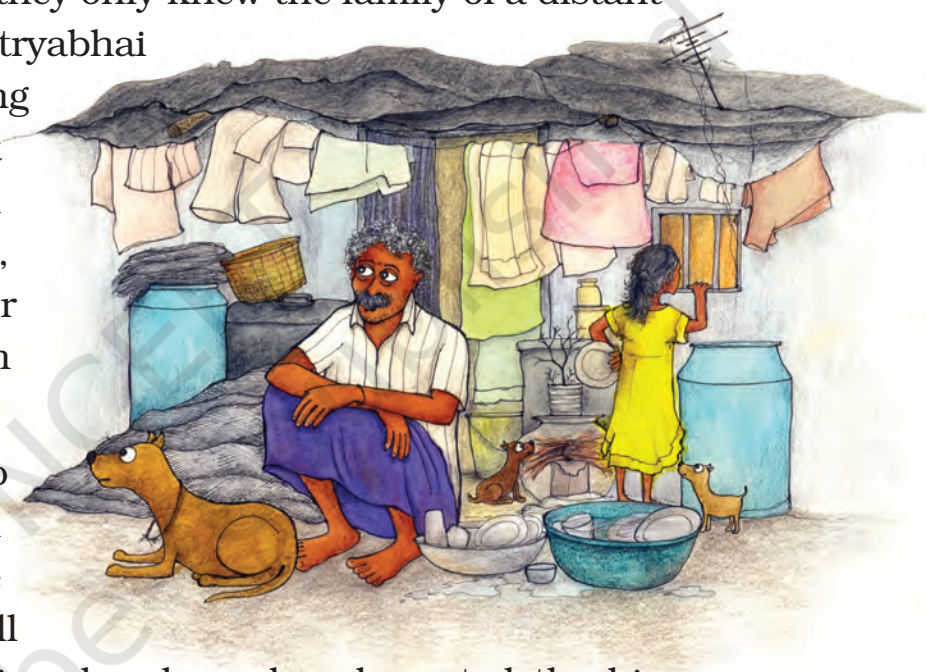
18. No Place for Us?

0529CH18

Jatryabhai

Jatryabhai was sitting at the door with his daughter Jhimli. They were waiting for Sidya. It was almost night but Sidya had not come home. Two years back Jatrya's family came to Mumbai from Sinduri village. Here, they only knew the family of a distant relative. With their help, Jatryabhai began to repair torn fishing nets. But the money he got was not enough. They had to pay for the medicines, food, school fees and rent for the house. Here, they even had to buy water.



Young Sidya also had to work in the nearby fish factory to earn some money. From four o'clock till seven o'clock in the morning, he cleaned and sorted the big and small fish. Then he would come home, take a nap, and go to school in the afternoon. In the evening he would wander around the vegetable market. He would help some *memsahib* (lady) to carry her bags, or go to the railway station to pick up empty bottles and newspapers to sell to the *kabadiwalla* (junk seller). Somehow they were managing their life in the city.

It was night, but Sidya had not come home. Jhimli was watching a dance on TV, through the neighbour's window. But Jatrya did not like watching TV. Here, everything was so

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different. The day would pass running around for work, but the evening brought back old memories.

Think and tell

- Jatrya felt alone, even in a crowd of people. Have you ever felt like this?
- Imagine how it feels to leave one's own place and go far away to live in a new place?
- Why do you think families like that of Jatrya's are coming to big cities?
- Have you seen any children (in your school or neighbourhood) who also go to work?
- What kind of work do they do? Why do they have to work?

Remembering old days

Jatrya was born in Khedi village, in the middle of thick green jungles and hills. His people had been living here for many years – even before his grandfather was born.

There was peace in Jatrya's village, but not silence. There were so many soothing sounds – the gurgle of the flowing river, the murmur of trees and the chirping of birds. People did farming. They would go to the nearby forest, chatting and singing together, to collect wild fruits, roots and dried wood. While working with elders, children also learnt many things – to dance together, to play flute and *dhol*, to make pots of clay and bamboo, to recognise birds and imitate their sounds, etc. People collected

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things from the forest for their use. Some of those they would sell in the town across the river. With that money they would buy salt, oil, rice and some clothes.

It was a village, but people here lived together like a big family. Jatrya's sister was married in the same village. People helped each other, in good and bad times. The elders would arrange weddings, and settle quarrels.

Jatrya was now a strong young man. He worked hard in the fields and caught fish from the big river. He and his friends would go to the forest to collect fruits, roots and plants for medicines, and fish from the river, to sell these in the town. During festival time, Jatrya would dance and play the drum, with boys and girls of his age.

Tell

- In Khedi village what all did children learn?
- What do you learn from your elders?
- Jatrya learnt so many things in Khedi. How many of those would be useful for him in Mumbai?
- Do you hear the sounds of birds everyday? Which ones?
- Can you imitate the sound of any bird? Show how.
- What are some of the sounds that you hear everyday, but the people of Khedi may not be hearing?
- Have you experienced silence? When and where?

Teacher's Note : Children can be made sensitive to the experience of 'calm' or 'peace' as clearly different from 'silence'. They can do this through the activity of listening to sounds with their eyes closed. When they are calm and the class becomes quiet, they can still hear many sounds. So there can be peace, but there need not be silence.

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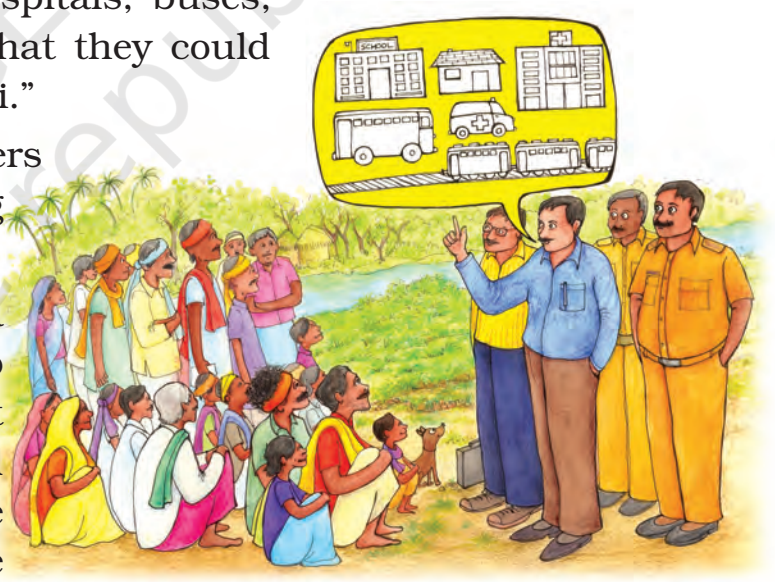
Across the river

One day the people of Khedi heard that a big dam was to be built on the river. For this, a big wall would be built to stop the flow of the river. Khedi and many nearby villages in that area would be drowned under water. The people would have to leave their villages and their lands, on which their forefathers had lived for centuries.

After a few days, government officials along with the police started visiting these villages. Small children of the village saw the police for the first time. Some children would run after them, and some would get scared and start crying. The officials measured the width and length of the river, the fields, forests and houses. They called meetings with the elders of the village. They said, "Villages on the bank of the river would have to be removed. People having land at Khedi will be given land far away, on the other side of the river. They will have everything there – a school, electricity, hospitals, buses, trains, etc. They will have all that they could not even dream of here in Khedi."



Jatrya's parents and most elders were not happy about leaving their village.

Listening to all this, Jatrya would get a little scared, but also feel excited. He would think that after getting married, he would take his bride to the new house in the new village. A house where he could just press a button for the light and turn on the tap for water. He could go by bus to see the city. When he would have children, he could send them to school. They will not be like him, who had never been to school.

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Discuss and tell

- Many people in Jatrya's village did not agree to move away from their land and forest. Why? They had to leave even though they didn't want to. Why?
- In Khedi, how many people were there in Jatrya's family? When he thought about his family who all came to his mind?
- Who all come to your mind when you think about your family?
- Have you heard of people who don't want to be moved from their old place? Talk about them.
- Do you know some people who have never been to school? Do you also know of any place where there is no school?

Imagine

- Think of the kinds of difficulties people have to face where a dam is being built.
- Draw a picture of Khedi village and a picture of Jatrya's dream village. Discuss the differences between them. Also look at the pictures your friends have drawn.

A new place

It was a summer afternoon. Jatrya was feeling faint in the hot sun and wind. His feet were burning on the coal tar of the *pucca* road. There wasn't a single tree to offer some shade. Just a few houses and shops. Jatrya was on his way home after buying medicines. He had an old tyre on his back. These days, he had

Teacher's Note : Discuss with children the different aspects of dams. You can give examples of any dams in your area or nearby. Dam may benefit some, but there are some people for whom dam may bring problems, all these can be discussed in classroom.

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to light his stove with just these rubber pieces of old tyres. These caught fire fast, and also saved some firewood. But the smoke and smell of burning tyres were terrible!

In this new Sinduri village, they had to pay money for everything—medicines, food, vegetables, firewood, and fodder for the animals. They could just not afford to buy kerosene. But from where to get the money for all this?

Thinking of all this, Jatrya reached home. The roof made of a tin sheet made the house hot like an oven. Jatrya's wife had high fever. His daughter Jhimli was rocking her little brother Sidya to sleep in her lap. After all, there was no other older person with them. Jatrya's parents had been so sad about leaving Khedi that they had died before he moved here.

In Sinduri there were only eight-ten families he could call his own, those from his old village. The whole village had got scattered and people had gone wherever they had been given land.

This was not like the new village Jatrya had dreamt about. There was electricity, but only for sometime in a day. And then, the electricity bill had also to be paid. There were taps, but no water!

In this village, Jatrya got just one room in a tin shed. It had no place to keep the animals. He also got a small piece of land. But that was not good for farming. It was full of rocks and stones. Still Jatrya and his family worked very hard. But they could not grow much on the field, and could not make enough money even to buy seeds and fertilisers. In Khedi, people did not fall sick often. If someone fell ill there were many people who knew

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how to treat them with medicines made from plants. People felt better after taking those medicines. Here in Sinduri, there was a hospital but it was difficult to find doctors, and there were no medicines.

There was a school here, but the teacher did not care much about the children from Khedi village. These children found it difficult to study in a new language. The people of Sinduri did not welcome the newcomers from Khedi. They found their language and way of living strange. They made fun of the Khedi people by calling them 'unwanted guests'. Not much of what he had dreamt had come true!

Write

- Was Sinduri like the village of Jatrya's dreams?
- What difference did he find between Sinduri and his dream village?
- Have you ever been to anyone's house as an 'unwanted guest'? How did you feel?
- What all does your family do, when you have guests at home for a few days?

Some years later

Jatrya stayed for a few years in Sinduri. The children were also getting older. But Jatrya's heart was not here in Sinduri. He still missed his old Khedi.

But there was no Khedi now. There was a big dam and a big lake of collected water in and around Khedi. Jatrya thought, "If we are to be called 'unwanted guests', then at least let us go to some place where our dreams can come true." Jatrya sold his land and his animals and came to Mumbai. Here, he started a new life with his family. His only dream was to send his children to school, to give them a better future, a better life.

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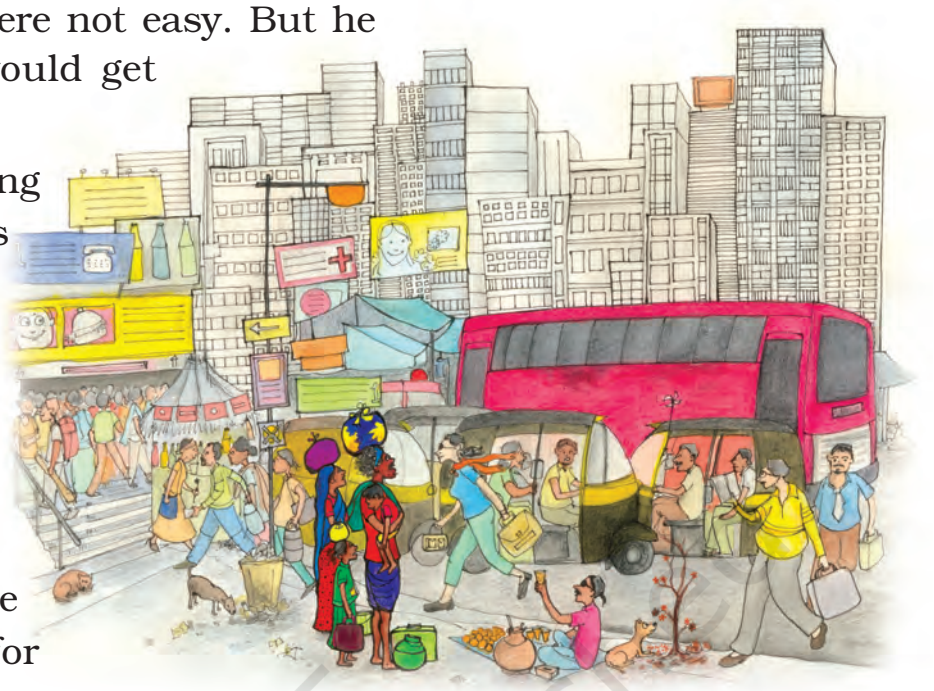
Here too, things were not easy. But he hoped that things would get better.



Jatrya started saving money to repair his one-room shack. His relatives would tell him, "Don't waste money on this. Who knows, we may have to move from here too. In Mumbai there is no place to stay for outsiders like us."

Jatrya was scared and worried. He thought, "We left Khedi for Sinduri, we then left Sinduri for Mumbai. If we have to move from here too, then where can we go? In this big city, is there not even a small place for my family to stay?"

Think

- What had Jatryabhai thought while moving to Mumbai? Did he find Mumbai as he had imagined?
- What kind of school do you think Jatrya's children would be going to in Mumbai?

Teacher's Note : Discuss with children about the difference between people being 'displaced' or asked to move from a place, and those who go on a 'transfer'. Both situations may cause different kinds of problems and difficulties. Discuss how many big projects like dams, bridges, highways, factories are promoted in the name of development. Do all people benefit from these? These are live issues which can be related to many newspaper reports and ongoing debates.

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Find out and write

- Do you know of any family that has come to your town after having moved out of their place? Talk to them and find out:
  - From where have they come? Why did they have to come here?
  - What kind of place did they live in there? How do they find this new place compared to the old one?
  - Is their language and way of living any different from that of the people here? In what ways?
  - Learn some words from their language and write them in your notebook.
  - Do they know how to make some things that you cannot make? What?
- Have you ever read or heard of a city slum being removed? How do you feel about this?
- People also shift from one place to another when they get transferred in their jobs? How do they feel then?

Debate

- Some people say that – "The city people do not create garbage. Cities are dirty because of the slums." How do you feel about this? Discuss and debate between yourselves.

What we have learnt

- Like Jatrya's family, thousands of families come to stay in big cities for many different reasons. Do you think their life may be better in a big city from what it was before? Imagine how they feel in a big city.

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0529CH19

19. A Seed Tells a Farmer's Story

I am a small seed!

I am a small *bajra* seed. I have stayed in this beautiful wooden box since 1940. I want to tell you my story. This is a long story – but not mine alone. It is also the story of my farmer Damjibhai and his family. If I do not tell my story now, it might be too late!

I was born in Vangaam in Gujarat. That year there was a good *bajra* (millet) crop. There was a festive mood in the village. Our area was famous for its grain and vegetables. Each year Damjibhai kept aside some seeds from a good crop. This way our *bajra* family went on from one generation to another. Good seeds were stored in dried gourd (*lauki*) which was coated with mud. But that year Damjibhai himself made a strong wooden box to store us. He put in *neem* leaves to protect us from insects. He put different seeds in different compartments of the box. That was our beautiful home!

In those days Damjibhai and his cousins lived together. It was a large family. Everyone in the village helped each other, even in farming. When the crop was ready and harvested, everyone celebrated together. Oh! Those wonderful days! With big feasts and lots to eat!

In the winter, it would be time to enjoy the *undhiya* (a kind of stew). All the vegetables were put into a clay pot, along with fresh spices. The pot was sealed and kept between hot coals. The vegetables cooked slowly in this special cooker, on the fields.

Teacher's Note : Encourage children to talk about their experiences before beginning the chapter. Millet has been used only as an example. The children can be asked to narrate their own observations about changes in crops and vegetables that have taken place in their area.

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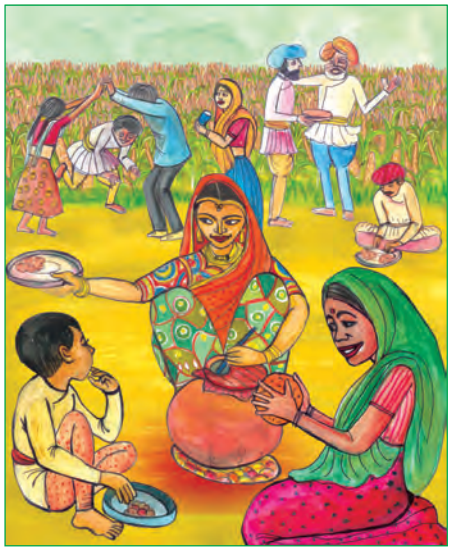

Oh, I forgot, the pot was placed upside down! That is why the dish was called *undhiya* or "upside down" in Gujarati. *Undhiya* would be eaten with *bajra rotis*, freshly cooked on the *chulha*. Oh, what an earthy delicious flavour! Along with that, home-made butter, curd and buttermilk was served.

Farmers would grow many different kinds of crops – grains and vegetables – according to the season. The farmers kept enough for their needs and sold the rest to shopkeepers from the city. Some farmers also grew cotton. At home, family members spun cotton on a *charkha* (spinning wheel) to make cloth.

Tell

- Are *rotis* made in your home? From which grains are they made?
- Have you eaten *roti* made from *bajra* or *jowar*? Did you like these?

Find out and write

- In your house what is done to protect grains and pulses from insects?
- Which are the different festivals related to farming, celebrated in different seasons? Find out more about any one such festival and write in your notebook –

  The name of the festival, in which season is it celebrated, in which states of India, what special foods are made, is it celebrated only at home with the family, or together with many people.
- Talk to the elders in your family and find out if there were some special foods cooked earlier that are not cooked any more?

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- Find out about the crops – cereals, vegetables, pulses – that are grown in your area. Of those, is there anything that is famous across the country?

Can you recognise these grains?

When times changed

Over the years, many changes took place in the village. Some places could get water from the canal. They said the canal brought water from far away – where a dam had been built on a big river. Then electricity came. Switch on the button and there was light! People found that only one or two crops, like wheat and cotton, got better prices in the market. So most farmers began to grow only these. Soon we – old friends *bajra* and *jowar*, and also vegetables – were forgotten and dismissed, even from Damjibhai's fields! Farmers even began to buy seeds from the market. People said they were new kinds of seeds. So farmers did not need to store seeds from the old crop.

Now people in the village cooked and ate together only on very special days. As they ate, they would remember how tasty the food used to be in the past – fresh from the fields. When the seeds have changed, how could food ever taste the same!

Damjibhai was getting old. His son Hasmukh looked after the fields and the family. Hasmukh was making a lot of money from farming. He rebuilt the old house. He brought new machines for farming. He used an electric motor to pump water. He bought a motorcycle to go to the city easily and also a tractor to plough the field. The tractor could do in a day, what the bullocks would take many days to do.

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Hasmukh would say, "Now we are farming wisely. We grow only what we can sell in the market at a good price. With profits from our fields we can improve our life. We can make progress."

Lying forgotten in the wooden box, I and the other seeds had our doubts. Is all this really progress? There is no longer any need for seeds like us, and animals like the bullocks. After the tractor has come, even people who worked on the fields, are no longer needed. How will they earn money? What will they live on?

Discuss

- The *bajra* seed saw differences in the way Damjibhai and Hasmukh did farming (for example, in irrigation, ploughing, etc). What were these differences?
- Hasmukh said, "With profits from our fields, we can progress." What is your understanding of 'progress'?

Write

- What kind of progress would you like to see in your area?

More and more expenses

The next twenty years saw even more changes. Without cows and buffaloes, there was no cow dung, to be used in the fields as fertilizer. Hasmukh had to buy expensive fertilizer. The new kinds of seeds were such that the crops were easily affected by harmful insects. Medicines had to be sprayed on the crops to keep away

Teacher's Note : Use children's experiences to discuss the kinds of changes which have taken place in agricultural practices over the years and the possible reasons for that. Newspaper reports should also be used.

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the insects. Oh, what a bad smell these had, and how expensive they were!

The canal water was not enough for the new crops. All the farmers used pumps to lift water from deep under the ground. To meet all these expenses, loans had to be taken from the bank. Whatever little profit was made, was used to repay the loan.

But there was little profit! Everyone was growing cotton, so the cotton prices were not as high as before. The soil itself was no longer the same. Growing the same crop over and over, and using so many chemicals, had affected the soil so much that now nothing could grow well there. It was becoming difficult to earn a living by farming alone.

Hasmukh too changed with the times. He is often tense and angry most of the time. His educated son Paresh did not want to do farming. He now started work as a truck driver. After all, the bank loans still had to be repaid. Often Paresh doesn't come home for days. At times he is away for a week. Two days back when he came home, Paresh started looking for something. "*Ba*", he asked his mother, "Where is Dadaji's wooden seed box? It will be useful to keep the screws and tools for the truck." Now do you understand why I told you my story?

Discuss and think

- What can happen to Hasmukh's farm after some years?

Teacher's Note : It is important to give space to children to freely express what they understand by 'progress' and 'development'. Contemporary debates around the world can be linked to this discussion – for example, farmer's struggles in developing countries, efforts to save traditional seeds and medicines, and who has the right over all this knowledge – farmers or the big multinational companies?

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- Damjibhai's son Hasmukh chose to become a farmer like his father. Hasmukh's son Paresh is not a farmer, but a truck driver. Why would he have done so?
- The seeds were not sure that what Hasmukh was talking about was really progress. What do you feel?
- Have there been any changes near your area, which may be difficult to call 'progress'? What changes are these? What are the different opinions about them?

Read the report from a newspaper and discuss it.

Tuesday, 18 December 2007, Andhra Pradesh

Farmers in Andhra Pradesh have been sent to jail for not being able to pay back their loans. They had suffered a big loss in farming. One of these farmers, Nallappa Reddy, had taken a bank loan of Rs. 24,000. To repay the loan, he had to take another loan from a private moneylender, at a very high rate of interest. Even after repaying Rs. 34,000 Reddy could not repay the entire loan. Reddy says, "The bank sends farmers to jail for not paying back small loans. But what about the big businessmen? They take loans of crores of rupees. Nothing happens to them when they do not return the money!"

Nallappa Reddy's story is shared by thousands of farmers in India who are suffering huge losses. The situation is so bad that many farmers see no way out of this except to commit suicide. According to government figures 1,50,000 farmers have died like this between 1997 and 2005. This number may be much higher...

Project Work

- What questions come to your mind about farmers and farming? Write some questions in your group and ask a farmer. For example, how many crops do they grow in a year? Which crop needs how much water?
- Visit a farm near your area. Observe and talk to the people there. Write a report.

Read the report on page 180 by a group of Class V students who went to visit Bhaskarbhai's farm.

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Bhaskarbhai's Farm (Dehri village, Gujarat)

As we entered his farm, we were surprised. There were dead leaves, wild plants, and grass everywhere! Some of the tree branches seemed so dry, as if eaten by insects. At places we saw some plants with colourful leaves. Why these? Bhaskarbhai said they were croton plants which gave him a signal when the soil became dry. We were surprised! How? He explained that the roots of the croton do not go deep in the ground. So when the top layer of the soil becomes dry, the croton leaves bend and become limp. This signal tells Bhaskarbhai which part of his farm needs to be watered.

We found the soil soft and crumbly. We could see tall coconut trees, full of fresh coconuts. We thought he must be using some special fertilisers. Bhaskarbhai said he does not buy fertilisers made in factories. His soil is fertile because of all the dried leaves which slowly rot and mix with it. He dug the soil a little and told us to look. We saw thousands of earthworms! "These are my soil's best friends", he said. The earthworms soften the soil as they keep digging underneath to make tunnels. This way air and water can easily get into the soil. The earthworms also eat the dead leaves and plants, and their droppings fertilise the soil.

Pravin told us about his uncle in the city, who has dug a pit in his garden. He puts dried leaves in the pit, along with all the kitchen waste – peels of vegetables and fruits, and leftover food. He also has earthworms in the pit. They turn the waste into compost (a natural fertiliser). So his uncle gets good fertiliser without spending extra money.

We all had some fresh coconuts from the farm. They were really tasty! We also learnt so much about a new way of farming!

Group members : Praful, Hansa, Krutika, Chakki, Praveen, Class–5C

Journey of a *bajra* seed–from a field to a plate

What can you see in each picture on the next page?

In picture 2 you can see the *bajra* cobs in the mortar (*okhli*, used for crushing). The cobs are crushed with a pestle (*moosli*) and the seeds are separated from the cob. You can see the separated seeds in picture 3. Now this work is also done by big machines, like threshers. We call both these as different 'technologies' – using our hands or big machines – to crush the seeds.

- What technology could have been used to cut the stem in picture 1? What do you think is being done in the grinder (*chakki*) in picture 4? What ways (technologies) would have

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been used to do the work shown in picture 5 and 6? You can see that the dough is ready in picture 6. When do you think a sieve (*chhalni*) would have been used? Discuss each step in detail, in **any language** you wish to use.

Rainy I A Murkery

Milamber

Claud Rinolt

Aparna

What we have learnt

- There have been many changes over time, in our food. What can this mean? Use the seed story and what you know from your elders to explain.
- What would happen if all the farmers were to use only one kind of seed and grow only one kind of crop?

Teacher's Note : We often limit our understanding of the word 'technology' to mean only big machines and instruments. A process or method is also a 'technology', for which we might normally use the word technique. For example, we could discuss how making dough from dry *atta* (flour) is also a 'technology', a special process. Straining the flour, pouring water slowly while kneading (you will surely appreciate this, if you have made a mess by putting too much water!), bringing it to the desired consistency, and at the end collecting the dough into one big lump - all these might be difficult to describe in words but are important to understand as processes. Encourage children to speak in their home language; do not expect them to do it in English.

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0529CH20

20. Whose Forests?

Daughter of the jungle

Look at the picture. Where do you think these children are off to, with little bundles on their sticks? When you find out you too would want to go with them!

The children are going to the forest. There they jump, run, climb trees and sing songs in their language called Kuduk. They pick the fallen flowers and leaves, to weave them into necklaces. They enjoy the wild fruits. They look for birds, whose calls they imitate. Joining them in all this fun is their favourite *didi* – Suryamani.

Nitin Upadhaye

Every Sunday Suryamani takes the children to the forest. As they move around, she shows them how to recognise the trees, the plants, and animals. Children enjoy this special class in a forest! Suryamani always says, "To learn to read the forest is as important as reading books." She says,"We are forest people (adivasis). Our lives are linked to the forests. If the forests are not there, we too will not remain."

Suryamani's story is a true story. Suryamani is a 'Girl Star'. 'Girl Stars' is a project which tells extraordinary tales of ordinary girls, who have changed their lives by going to school.

Teacher's Note : Encourage children to share their experiences and imagination about forests. Planting thousands of trees does not make a forest. It is important to discuss the web of relationships between plants, trees and animals in a forest, to see how they depend on each other for food, security and habitat.

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Discuss

- What do you think is a forest?
- If someone grew lots of trees close to each other, would this become a forest?

Find out and write

- Other than trees what all is there in a forest?
- Do all forests have similar types of trees? How many trees can you identify?
- Suryamani says, "If the forests are not there, we too will not remain." Why so?

Nitin Upadhaye

Growing Up

Suryamani loves the forest since she was a child. She would not take the direct road to school, but would choose the path through the forest. Suryamani's father had a small field. Her family used to collect leaves and herbs from the forest and sell these in the bazaar. Her mother would weave baskets from bamboo or make leaf plates out of the fallen leaves. But now no one can pick up a single leaf from the forest.

That is since Shambhu the contractor came there. The people of Suryamani's village were afraid of the contractor. Everyone except Budhiyamai. She would say, "We the people of this forest have a right over it. We look after our forests, we don't cut trees like these contractors do. The forest is like our 'collective bank' – not yours or mine alone. We take from it only as much as we need. We don't use up all our wealth."

Teacher's Note : It would be useful to begin this lesson with a discussion about the lives of forest-dwellers and their relationship with the forest. Also about who a contractor is and what is a contract. This lesson draws upon the true story of Suryamani, whose organisation works on these issues. Discussions can also include similar organisations or people working to save forests and forest people in your area.

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Suryanani's father could no longer support the family on the small land. He moved to the town in search of work. But things did not improve. Sometimes there would be no food in the house. At times Maniya Chacha (uncle) would send some grain from his small shop to Suryamani's house.

Chacha tried hard and got admission for Suryamani in the school in Bishanpur. Here they would not have to pay for the fees, uniforms and books. Suryamani would have to stay there and study. Suryamani didn't want to leave her village and forest. But Maniya Chacha was firm. "If you do not study, what will you do? Go hungry?" Suryamani would argue, "Why should I go hungry? The jungle is there to help!" Chacha tried to explain, "But we are being moved away from our forests. Even the forests are disappearing – in their place mines are being dug, dams are being built. Believe me, it is important for you to study, to understand about the laws. Maybe then you can help to save our forests". Young Suryamani listened, and tried to understand some of what he said.

Think and write

- Do you know anyone who loves the forest?
- The contractor did not allow Suryamani's people to go into the forest. Why?
- Is there any place around your area which you feel should be open to everyone, but where people are not allowed to go?

Discuss

- Who do you think the forest belongs to?
- Bhudhiyamai said –"Forest is our 'collective bank' – not yours or mine alone." Are there other things which are our collective wealth? So if someone uses more, everyone would suffer?

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Suryamani's journey

Suryamani was filled with joy on seeing the school at Bishanpur. The school was near a thick forest. Suryamani studied hard and passed her B.A. after getting a scholarship. She was the first girl in the village to do this. While she was in college she met Vasavi *didi*, a journalist. Suryamani soon joined her to work for the *Jharkhand Jungle Bachao Andolan* (Movement to Save the Forests of Jharkhand). This work took Suryamani to far off towns and cities. Her father did not like this. But Suryamani continued her work. Not only that, she also started to fight for the rights of the village people. Her childhood friend Bijoy helped her in this work.

Nitin Upadhaya

Suryamani had another friend 'Mirchi', who stayed with her day and night. Suryamani would share all her thoughts and dreams with Mirchi. Mirchi would listen and say "Keee Keee."

Suryamani had a dream. for her Kuduk community. She wanted all her people to feel proud of being adivasis.

Think and write

- Do you have a friend with whom you can share everything?
- Some people have moved so far away from the forest, that they can't understand the lives of forest people. Some even call them 'jungli'. Why is it not correct to say this?
- What do you know about how adivasis live? Write and draw a picture.
- Do you have an adivasi friend? What have you learnt about the forest from her.

Teacher's Note : There should be a debate on the need and also the problems associated with the building of big dams, roads, mining projects, etc. It is important for students to discuss and understand that all of these – drawing out water, petrol or digging for minerals from under the ground, or commercial fishing from the seas – are examples of using our 'common resourses'. All these are important issues today.

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Suryamani's Torang

Nitin Upadhaya

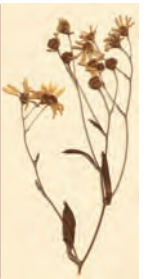
Suryamani was 21 when she opened a centre, with the help of Vasavi *didi* and others. She called it 'Torang', which means jungle in the Kuduk language. Suryamani wanted that on festivals people should sing their own songs. They should not forget their music and should enjoy wearing their traditional clothes. Children should also learn about herbs, medicines, and the art of making things from bamboo. Children should learn the language of school but must link it with their own language. All this happens in the 'Torang' centre. Many special books about the Kuduk community and other adivasis have been collected. Flutes and different types of drums are also kept there.

Whenever something is unfair, or if someone is afraid that his land and livelihood would be taken away, they turn to Suryamani. Suryamani fights for everyone's rights.

Suryamani and Bijoy have got married and work together. Today their work is praised by many people. She is invited, even to other countries, to share her experiences. People of her area are also raising their voice for a new forest law.

Right to Forest Act 2007

People who have been living in the forests for at least 25 years, have a right over the forest land and what is grown on it. They should not be removed from the forest. The work of protecting the forest should be done by their Gram Sabha.



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Think

- Do you know of any one who works to save forests?
- What is your dream? What will you do to make your dream come true?
- Collect reports about forests from newspapers. Did you find any news about how the cutting down of forests affects the weather? How?
- In 'Torang' Suryamani does a lot to keep the Kuduk music, dance and traditions alive. Would you like to do something like this for your community? What would you like to keep alive?

Read and tell

- Sikhya, a Class X girl in Odisha, wrote a letter to the Chief Minister. Read a part of the letter.

A forest is everything for us adivasis. We can't live away from the forests even for a day. Government has started many projects in the name of development – dams and factories are being built. Forests, which are ours are being taken away from us. Because of these projects, we need to think where the forest people will go and what will happen to their livelihood? Where will the lakhs of animals living in the forests go? If there are no forests, and we dig out our lands for minerals like aluminium, what will be left? Only polluted air, water, and miles and miles of barren land...

- Is there any factory or some construction work going on in and around your area? What type of work?
- Due to the factory is there any effect on the trees and land? Have the people in that area raised this issue?

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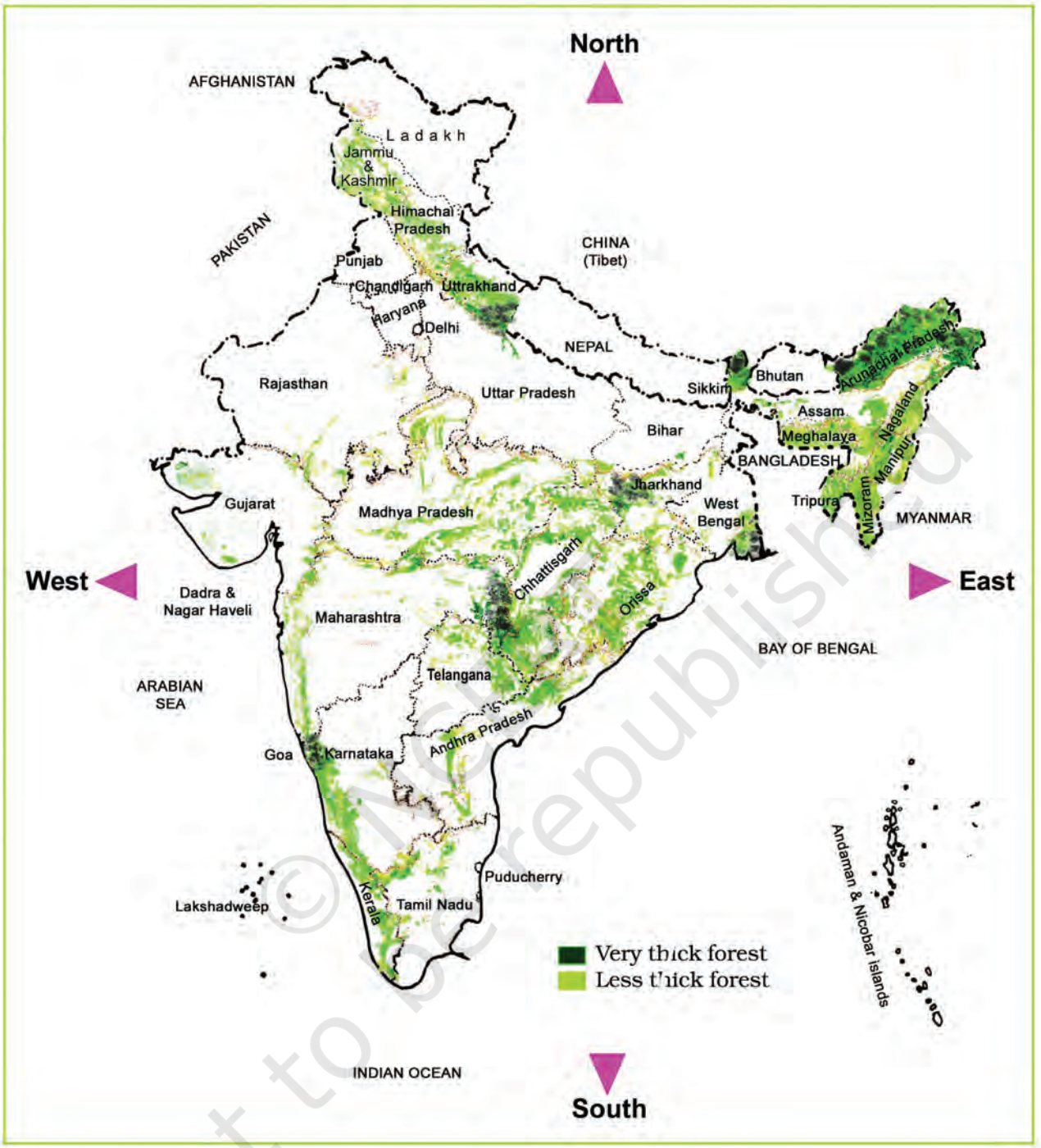

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Look at the map and write

- What all is shown in the map?

- You have read Sikhya's letter. Look for Orissa in the map.
- Is there a sea close to Orissa? How did you find out?
- Which are the states which have the sea on one side?
- Where is Suryamani's state Jharkhand on the map?
- Where are forests on the map? How will you find these?
- How can you find out which states have very thick forests and which have less thick forests?
- For someone in Madhya Pradesh, in which direction would the country's thickest forests be? Name those states.

Daman Singh

Lottery for farming in Mizoram

You read about the forests of Jharkhand in Suryamani's story. Now read about forests on the hills of Mizoram. See how people live there, and how farming is done.

Ding, Ding, Ding.... As soon as the school bell rang Lawmte-aa, Dingi, Dingima picked their bags and hurried home. On the way they stopped to drink water from a stream in a cup made of bamboo which was kept there. Today not only the children, even 'Saima Sir' was in a hurry to get back. Today there would be a special meeting of the Village Council (Panchayat). At the meeting there would be a lottery to decide which family will get how much land for farming. The land belongs to the whole village, not to separate people. So they take turns to do farming on different parts of the land.

A beautiful pot made of bamboo was shaken well. One chit was taken out. Saima Sir's family got the first chance. He said, "I am happy that my family gets to choose first. But, this year we cannot take more land. Last year I had taken more and was not able to farm it well. After my sister Jhiri got married and went away it is difficult to manage farming alone."

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Saima Sir asked for 'three tin' of land. Little Mathini asked, " What is three tin of land? Chamui explained, "The land on which we grow one tin of seeds is called one tin of land." One by one, the village families got their piece of land for farming.

Find out

- Which are the states around Mizoram?
- Chamui said they measure land using tin. Which are the other ways of measuring land?

- Returning from school, children drank water in a bamboo cup. Who do you think would have made this cup and kept it in the forest? Why?
- What could be done to save forests?

Jhoom farming

Jhoom farming is very interesting. After cutting one crop, the land is left as it is for some years. Nothing is grown there. The bamboo or weeds which grow on that land are not pulled out. They are cut and burnt. The ash makes the land fertile. While burning, care is taken so that the fire does not spread to the other parts of the forest. When the land is ready for farming it is lightly dug up, not ploughed. Seeds are dropped on it. In one farm different types of crops like maize, vegetables, chillies, rice can be grown.

Weeds and other unwanted plants are also not pulled out, they are just cut. So that they get mixed with the soil. This also helps in making the soil fertile. If some family is not able to do farming on time, others help them and are given food.

Teacher's Note : There can be some discussion about the hilly terrain of the North East, and the state of Mizoram, and also the unique system of jhoom farming followed there.

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The main crop here is rice. After it is cut, it is difficult to take it home. There are no roads, only hilly paths. People have to carry the crop on their backs. This takes many weeks.

Daman Singh

When the work is over the entire village celebrates. People get together to cook and eat, sing and dance. They do their special 'cheraw' dance. In this dance people sit in pairs in front of each other, holding bamboo sticks on the ground. As the drum beats, the bamboos are beaten to the ground. Dancers step in and out of the bamboo sticks, and dance to the beat.

Daman Singh

- Find out more about the 'cheraw' dance. Do it in your class. But be careful and don't hurt yourself.

About three-fourth people in Mizoram are linked to the forests. Life is difficult but almost all children go to school. You can see some of them here, playfully blowing their leaf whistles! You too have made many such whistles, haven't you!

What we have learnt

- What is similar and what is different between jhoom farming and Bhaskerbhai's way of farming?
- Explain in your own words why forests are important for the people living in forests?
- Did you find something interesting in jhoom farming? What is it?

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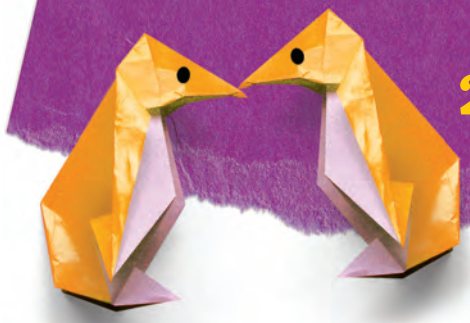

21. Like Father, Like Daughter

Aaa chhee!

Ashima was sitting near the window and reading. It was windy and there was a lot of dust in the air. Suddenly Ashima sneezed loudly—aaa chhee!

Ashima's parents were sorting out vegetables in the kitchen. Her mother said, "She sneezes just like you do. If you were not here, I would have thought it was your sneeze."

Fill in the table

- Ashima sneezed just like her father. Do you have any such habit or trait which is similar to that of someone in your family? What is it? Whom is it similar to?

Your special habit or trait	Whom is it similar to?
_____	_____
_____	_____

Teacher's Note : In Class III we had drawn attention to the similar traits children share with the immediate family members. Discussion can now focus on how some traits/features which are also similar in distant relatives in the extended family. This should be done through children's own experiences.

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Tell

- Does your face or anything else look similar to that of someone else in your family? What is it?
- Did someone tell you this or did you find it out yourself?
- How do you feel when people compare you with someone else in your family? Why do you feel so?
- Who laughs the loudest in your family? Laugh like that person.

Who is whose aunt?

Nilima had gone to the house of her *nani* (mother's mother) in the school holidays. She saw someone coming and went to tell her mother, "Amma, a *mausi* (mother's sister) has come to meet you." Her mother came out to see who had come. She told Nilima, "No, this is not your *mausi*! She is your sister Kiran. You know your eldest *nani*? Kiran is the daughter of her elder son. Kiran is your cousin sister. In fact, you are her cute son Samir's *mausi*!"

- Make a list of all the family members from Nilima's *nani* to little Samir. How are they all related to Nilima? Write.

Find out

- In your family are there any such examples of uncle-nephews or brother-sisters, where there is a big difference in the age? Find out from your elders.

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You look exactly like your dadi's cousin sister's second daughter!

How we are all related!

Nilima started playing with Samir. Her mother called Kiran and said, "See, my Nilima's hair is a lot like yours – thick, curly and black. It's good she does not have hair like mine – straight, limp and brown!" Nilima's *nani* laughed and said, "Yes, isn't it strange? We sisters had thick curly hair and now our second generation has similar hair." Nilima was listening to all this. She thought, "We are called 'distant' relatives, but, how closely related we are in many ways!"

Find out and write

- Does Nilima have curly hair like her *nani's*? Now you look for some special trait in your sister or brother (could also be cousins). Like the colour of eyes, dimples in cheeks, height, broad or sharp nose, voice, etc. See if this trait comes from the father's side or the mother's side. Make this table in your notebook and fill it. An example is given.

Special trait	Whom does it resemble?	From whose side? Mother's	Father's
Nilima's Curly hair	her *nani* (grandmother)	✓	

- Have you seen a very young child in your (or any other) family? Whom does the child's eyes, nose, hair or fingers look like in the family? Write their names.
- Nimila's hair is like her *nani's* – thick and curly. Nilima's mother has straight, brown and limp hair? What type of hair do you have – black or brown, oily or dry?

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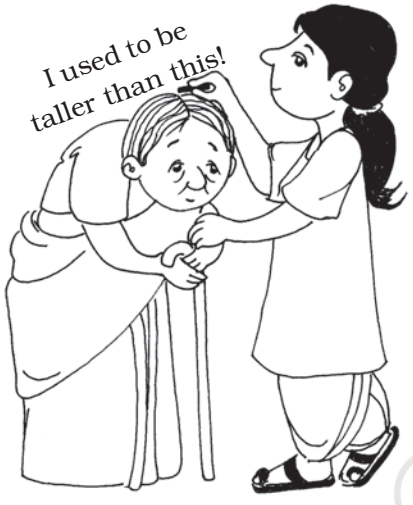
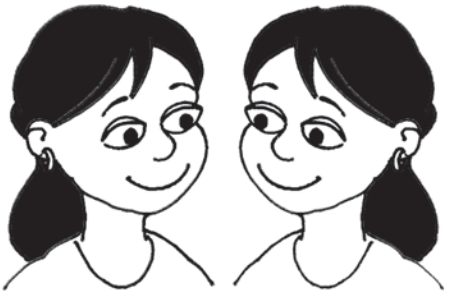
- What is the colour of your hair? Measure and write the length of your hair.
- Is your hair like that of anyone else in your family? If yes, then name the person.
- Measure the hair of other members of your family.
- Who has the longest hair in your family?
- How many people do you know whose hair is longer than one metre? Does having long hair run in their family?



- Do you know how to measure your height? Measure yourself from head to toe and write how tall you are.
- How tall do you think you will be when you grow up? Is anyone else in your family of the same height?
- Measure the height of your family members and write it down.

Is this a mirror?



Look at the next page. Is Saroja standing in front of a mirror? No, this is her twin! Did you get confused? Their mother's brother (*mama*) also gets confused when he sees them together. At times Saroja gets scolded for mischief done by Suvasini. Sometimes Suvasini tricks her *mama* and says, "Suvasini has gone out."

Teacher's Note : Encourage children to think of some ways of measuring hair and height.

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But now *mama* has learnt a trick. He says –Sing a song in *Marathi*! Why this funny trick? Read about them and you will understand.

The sisters were just two weeks old when Saroja's (father's brother's wife) *chachi* adopted her and took her to Pune. Everyone in *chachi's* house is very fond of music. Mornings begin with music in the house. Saroja knows many songs in both the languages – Tamil and Marathi. At home everyone speaks Tamil and at school most of the children speak in Marathi.

Suvasini stays with her father in Chennai. Her father is a karate coach. Since she was three, Suvasini started doing karate with the other children. On holidays, both father and daughter start practicing in the morning.

Saroja and Suvasini look alike but are also quite different. Do you now know why *mama* has his way of finding out who is who?

Discuss

- What is similar between Saroja and Suvasini? What is different?
- Do you know any twins? What is similar in them? How are they different?
- Do you know of twins who don't look the same?

Saroja and Suvasini look a lot like each other yet are different. For example, Saroja knows two languages. If Suvasini's family also talked in two languages she could also learn both. We learn many things like language, music, love for reading, or knitting, when we get a chance and an environment to do so.

Teacher's Note : Discuss with children that we acquire certain traits at birth from our parents. Certain things we learn from our environment.

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This from the family

Do this interesting survey in your class. Write how many children can do this :

1. Without touching your teeth fold your tongue towards the back of your mouth.
2. Roll your tongue by lifting it from the sides.

3. Open all the toes of your feet. Now without moving the others, move the little toe.
4. Touch the thumb to your wrist.
5. Make a 'V' by separating two fingers of your hand to each side.

6. Move your ears, without holding them.

Those children who could do any of these should ask their family members also to do so. So, how many children have got this trait from their family?

No, no, don't be worried! It is not that if any of the parents have polio, their child will also have it

But not this from parents...

Satti was only a few months old when one of her legs was affected by polio. But she never let this come in the way of her work and her life. Walking long distances and climbing many stairs has been a part of her work. Now Satti is married. Some people tell her not to have any children. She is also worried that her children may also get polio. She spoke to a doctor about this.

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- Have you read or heard anything about polio? Where?
- Have you read or heard any news about 'pulse polio'? What?
- Do you know of anyone who has polio?

Experiments with peas – rough or smooth?

Gregor Mendel was born in a poor farmer's family in Austria in 1822. He was very fond of studies but the very thought of examinations made him nervous (Oh! you too feel the same!). He did not have money to study at the University so he thought of becoming a 'monk' in a monastery. He thought from there he would be sent to study further. Which he was. But to become a science teacher he had to take an exam. Oh no! he got so nervous that he kept running away from the exam, and kept failing!

But he did not stop doing experiments. For seven years he did experiments on 28,000 plants in the garden of the monastery. He worked hard, collected many observations, and made a new discovery! Something which scientists at that time could not even understand! They understood it many years after his death, when other scientists did such experiments and read what Mendel had already written.

What did Mendel find in those plants? He found that the pea plant has some traits which come in pairs. Like the seed is either rough or smooth. It is either yellow or green, and the height of the plant is either tall or short. Nothing in between.

The next generation (the children) of a plant which has either rough or smooth seeds will also have seeds which are rough or smooth. There is no seed which is mixed – a bit smooth and a bit rough.

He found the same with colour. Seeds which are either green or yellow give rise to new seeds which are either green or yellow. The next generation does not have seeds with a mixed new colour made from both green and yellow. Mendel showed that in the next generation of pea plants there will be more plants having yellow seeds. He also showed that the next generation will have more plants with smooth seeds. What a discovery!

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Some from the family, some from the environment

From a distance Vibha knows that her *nana* (grandfather) is coming – from his loud laughter. *Nana* also talks loudly and hears with difficulty.

- Are there people in your house who talk loudly? Is it their habit, or they cannot also hear very well?
- Are there times when you do not talk loudly in front of some people? When? With whom? Why? When can you speak loudly?
- Some people use a machine in their ear to help them hear better. Some use a stick or spectacles to help them in other ways. Do you know someone who does so?
- Talk to people who cannot hear very well. Find out if they had this problem from birth. When did they start to have a problem with hearing? What difficulties do they face?

We have seen that some traits or habits we get from our family. Some things and skills we learn from our environment. At times our abilities change because of some illness or old age. All these together make us what we are!

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What we have learnt

What do you think – what all is a part of you that you got from your mother's side?

Teacher's Note : Discuss with children about polio which is caused by a virus and is not inherited. Many a times people have such misconceptions about some diseases like leprosy. Discuss, how and where these can be treated. If possible, invite a doctor to respond to the children's questions.

0529CH22

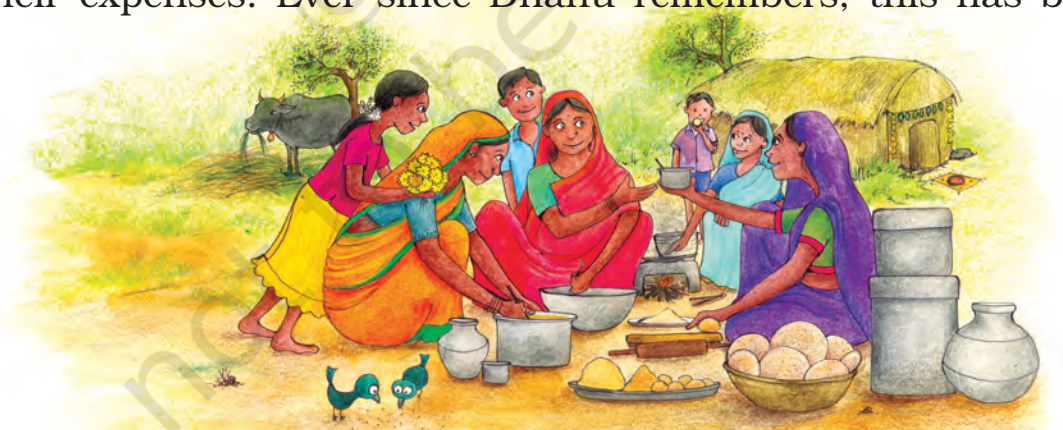
22. On the Move Again

Dhanu's village

Today all the relatives have come to Dhanu's house to celebrate Dussehra. They have come with their luggage in their bullock-carts. Dhanu's father is the eldest in the family. So all the festivals are celebrated at their house. Dhanu's mother (*Aai*), the wife of mother's brother (*mami*) and the wife of father's brother (*kaki*) are busy making *puranpoli* (sweet *rotis* made from jaggery and gram). Alongwith this a spicy *kadi* dish is also made.

The day passes in laughing and chatting. But by evening everyone's mood changes. The women and children begin to pack their luggage. The men sit down with the *mukadam* (agent who lends money) for the meeting. The *mukadam* gives the details of the loan taken by each family.

Then the talks for the next few months begin. The *mukadam* explains to the villagers in which areas they would go for the next six months. He also gives them some money as loan, for their expenses. Ever since Dhanu remembers, this has been



Teacher's Notes : Talk in the class about issues related to borrowing money, loans, debts and agents. Try to relate the meaning of these words by taking examples from daily life.

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the routine. Families like Dhanu's work on the lands of big farmers till Dussehra, before the rainy season. Many other families also work on such lands. They earn just enough money to keep them going through these months.

But how to manage the remaining six months, when there is no rain, and no work in the fields? So, everyone borrows money from the *mukadam*. To pay back this money, they have to work for the *mukadam*. *Mukadam* is an agent for sugarcane factories. He helps them to find work in sugarcane fields.

Tell

- Did all the farmers in Dhanu's village have their own land?
- During what time of the year did Dhanu's family get work in the village? During what time did they not have work?
- Do you know of any families like Dhanu's, who have to leave their villages for months in search of work?

Think and find out

- If people in Dhanu's village did not leave the village in search of work, what difficulties would they face in their own village?
- In Dhanu's village, there can be no farming when there is no rain. Do you think farming can be done even without rain water? How?

Teacher's Notes : Draw children's attention to the fact that sugarcane farming can be done during those months, when there is no rainfall. Discuss various methods of irrigation in the farms, like, tubewells, canals, wheel for water lifting etc. Ask children to draw these. If possible take them or ask them to go with their family to see these.

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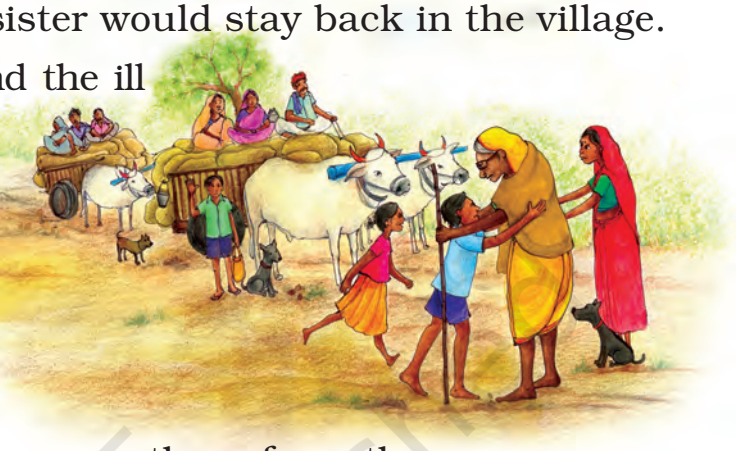
In the next few months, Dhanu, his parents, his *kaka* (father's brother) and his two elder children, his *mama*, *mami* and their two daughters, and forty-fifty other families from the village will stay away from home. In these six months, Dhanu and many children like him will not be able to go to school. Dhanu's old grandmother, aunt who cannot see, and two-month old cousin sister would stay back in the village.

In other homes too the old and the ill people stay behind. Dhanu misses his grandmother a lot. Dhanu always keeps wondering – who will take care of his grandmother! But, what can Dhanu do?



Think

- Dhanu's family and many others from the village go far away for work but some people stay back in the village. Why does this happen?
- When Dhanu and other children leave the village for six months, what happens in the village school?
- What arrangements are made at your home for old and unwell family members when everyone goes for work?

After Dussehra

The *caravan* of these families would now settle near the sugarcane fields and sugar factories. For six months they would stay in their huts made of dry sugarcane and its leaves. The men will get up early in the morning and go to cut sugarcanes in the fields. The women and children tie the bundles of sugarcane. Then the bundles are taken to the sugar factory. Dhanu often goes with his father. Sometimes, they spend nights outside the factory on bullock-carts. There, Dhanu plays with the bullocks and wanders around.

Teacher's Notes : You may be very careful and sensitive to deal with children if they wish to share problems related to drug addiction of their family members. The harmful effects of drugs/narcotics may be discussed in the class. Such issues should also be discussed in the inservice training programmes.

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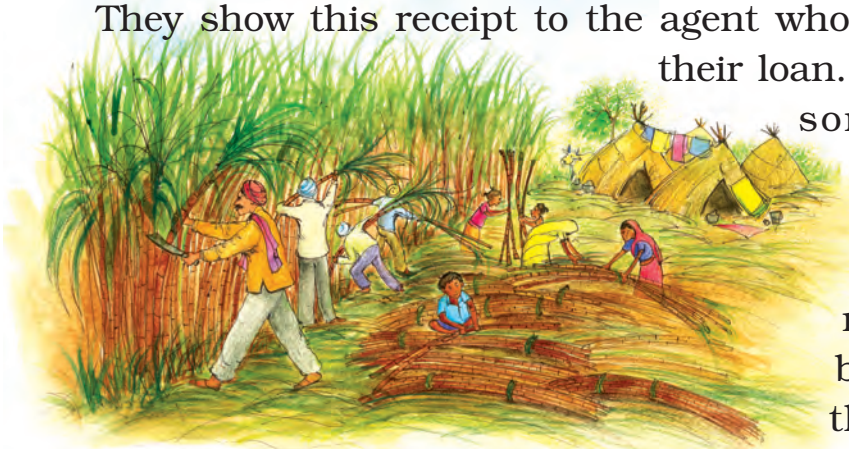
At the factory, Dhanu's father gets the sugarcane weighed and takes a receipt (a note to say how much sugarcane they have given). They show this receipt to the agent who then keeps an account of their loan. The agent also gives them some money for the next week's expenses. Then Dhanu's *aai* and *mami* take the children to the nearby village market, to buy *atta* (flour) and oil for the next week. Sometimes *mami* buys *laddoos* or some sweets for the children. She also buys pencils, an eraser and a notebook for Dhanu. After all he is *mami's* favourite! But Dhanu won't be using these for six months, because he won't be going to school.



Mami wants Dhanu to study and become somebody in life. She does not want Dhanu to move around with his family like this. *mama* and *mami* tell Dhanu's parents, "Next time when we leave our village after Dussehra we will leave Dhanu with his *dadi* and *chachi*. He will go to school like other children in the village. He should continue his studies. He should study further and become somebody."

Teacher's Notes : It may be possible that children from such families (Drug addicted members) may fall victim to such habits/practices. A timely action needs to be taken to prevent them. On this theme, charts and posters can be prepared by the children with the support of teachers and discuss in the class.

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Think and tell

- Why does Mami wish that Dhanu should go to school for the whole year and study?
- What happens when you are not able to go to school for a long time?

Discuss and write

- Dhanu has to go with his village people to other places. Can there be some arrangements during that time so that Dhanu continues his studies? What kind?
- Do you know of any jobs/work for which people have to stay away from their families for many months? Look for examples from this book and write.
- What are the similarities and differences in the lives of different kinds of farmers?

What we have learnt

- You have read about many kinds of farmers in different lessons in this book. Fill the table.

Name of the farmer	Owns land (✓ or ✗)	What do they grow	What difficulties do they face	Any thing else
1. *Damjibhai* (Lesson....)				
2. *Hasmukh* (Lesson....)				

Teacher's Notes : Discuss with children that some arrangements can be made for educating children of communities that are on the move. Many times the teacher moves along with them. Also discuss for what kind of work some communities migrate from one place to another.

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